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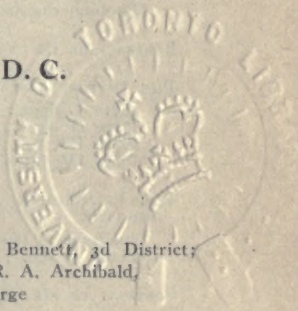
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OCTOBER, 1919

No. 1

LET US HAVE A ROUSING SOUTHERN MEETING.

The 56th annual meeting of the A. V. M. A. will soon be upon us. In forty-eight days the veterinary forces of the United States and Canada will foregather in the metropolis of the South for the second southern meeting in the history of the organization. That they will be welcome, is a foregone conclusion, as such an event has been looked forward to with pleasure for, lo, these many yeears; and no doubt many of the members, having long anticipated a trip South, will now be delighted to feel that their desires are about to be gratified.

Indications point to a large attendance, and with this prospect in view, those in charge at the southern end of the line are putting forth every effort to add to the success of the meeting and make it an event that will be long and pleasurably remembered by all who are fortunate enough to attend. Some further useful and interesting information by Dr. E. I. Smith, chairman, Committee of Arrangements, may be found in this number of THE JOURNAL.

New Orleans has become a great convention city, where many of the largest organizations in the country meet; and

being one of the most unique in the United States, it offers to the visitor many interesting things that are not to be seen in any other part of the country. The date selected for the meeting is a very propitious one, so far as weather conditions are concerned, and should do away with the impression, which some may still entertain, that the weather is always hot in that section of the country.

The literary part of the program will, we are assured, be excellent in every feature; and added interest will be given to it by a strong contingent from the Army Veterinary Corps, with its recent and ripe experience gained in active service both at home and overseas.

The Association is so rapidly increasing in membership, and with increased problems to be solved for the good of the whole profession, that important topics for discussion will no doubt come up at the New Orleans meeting which should invite a numerous attendance. Besides, the South is now largely represented in the Association; and as it is not probable that another meeting will be held so far south for some time to come, it should behoove the members to try to make the coming convention one whose presence will not only be appreciated for the time-being, but whose effect will be lasting in adding and benefitting the profession in the South, where such is so much needed, and, incidentally, the stockowning public, whose interests are yearly growing in importance. We repeat, therefore, let us have a rousing Southern meeting, in November, in the Crescent City.

THE CARRIER PROBLEM IN COMMUNICABLE DISEASE.

Shaw¹ made the statement, that, "with the advance of scientific research our old pet theories go on the scrap heap while new theories are evolved. Now that transmission of disease through the air and by fomites has been disproved, the present explanation is that communicable disease is transmitted only by means of infected persons, unrecognized cases and healthy carriers." This statement was made in connection with the subject of cerebro-spinal meningitis in human beings, and might apply to other infections in the human family. It has an application, however, to disease of a communicable nature in the subjects with which the veterinarian has to deal. Take the ques-

tion of anthrax, for example. Morris,² of the Louisiana Experiment Station, proved, by experiment, that numerous animals, of the flesh-eating variety, and also carrion-feeding birds, were capable of spreading the spores of this infection, after feeding upon anthrax-infected flesh, or artificially-prepared ingesta containing the organisms. These carriers included the hog, dog, cat, opossum, chicken and the buzzard, and with the exception of the buzzard, spores were found in the feces. In the case of the buzzard, however, while the excrement did not contain spores, infection was found on the beak and feet of these birds after they had fed upon anthrax material.

Later,³ the same investigator found that blood-sucking flies, of the skin-piercing variety, as well as mosquitoes, after they had fed on the blood of anthrax-infected animals (guinea-pigs) were capable of transmitting infection to healthy ones.

And still later,⁴ Morris found that non-biting, or surface sucking flies, such as the common house-fly, "blue-bottle" fly, etc., could carry infection from anthrax flesh to a healthy animal by simply walking over a fresh surface wound on the latter.

Instances and references might be multiplied in the case of this, as well as other infections, to show that the solution of the carrier problem in communicable disease is of the utmost importance in the control of this class of diseases; but of greater importance, to the veterinary sanitarian, especially, is the careful and sanitary treatment and disposal, or destruction, of the sources from which the numerous living carriers obtain their supply of infection. And in a great majority of cases, at least, this resolves itself down to the effective manner in which germ-laden carcasses are disposed of. So that we may have our live stock sanitary laws and our protective agents in the way of biologics, but until we can have those laws rigidly enforced, especially with regard to the thorough destruction of infected carcasses, and the sources of supply eliminated, the carrier problem is going to remain a very serious one in its relation to some of our most decimating animal infections.

1. Shaw, H. L. K.: The Cause of a "Sporadic" Case of Cerebro-spinal Meningitis, *Am. J. Dis. Child.* 18: 101 (Aug.) 1919.

2. Louisiana Bulletin No. 136. (Nov.) 1912.

3. Louisiana Bulletin No. 163. (March) 1918.

4. Louisiana Bulletin No. 168. (May) 1919.

Dr. Chas. H. Higgins (Montreal) will lecture this year at the New York State Veterinary College, New York University.

THE TUBERCULIN TEST.

G. E. JORGENSEN, Clermont, Iowa.

In the July number of the JOURNAL there is a very interesting report on a test and retest of a herd of cattle by Dr. D. H. Jones, of the Ontario Agriculture College. This article brings us face to face with two very important points. They are, 1st, the reliability of the test based upon its proper application, and, 2nd, the time for the retest.

1st—The reliability of the test based upon its proper application. In my opinion the success or failure depends primarily upon the patient, careful and painstaking work of the practitioner. There is a great tendency on the part of many busy practitioners to do this work in between calls. This results in irregular, inaccurate and often prematurely concluded tests. This absolutely will not do. What is worth doing at all is worth doing well, and in this case it must be done well or it is worse than if not done at all. There is only one thing to do; and that is to demand enough for the work so that one can afford to devote one's entire time to that particular test or let someone else do it who has the time and patience. I want to cite a case which I disposed of for the State a month ago. This was a seven-year-old grade cow tested in the usual way with a number of others in a town where for the people's safety a test ordinance had been passed. The post tuberculin temperatures in this case had been concluded on the 16th hour. The next morning, 32 hours after the injection of tuberculin, she developed an ailment composed of a temp. of 106.5 and a slight induration of the left posterior mammary gland. It was both possible and probable that this was an extemporaneous and subsequent mammitis having no bearing on the test whatever; however, I absolutely could not place any reliance on the test as made, hence upon conferring with Dr. Wall, State Veterinarian of Iowa, I placed her in quarantine for a retest on suspicion, and made several smears and inoculations on proper media with the milk from the affected quarter after treating it with antiformin.

Out of twelve smears I demonstrated the characteristic acid-fast organism in 2 smears, but was not able to develop any growth upon the media.

On retest this cow reacted on the 16th hour, and upon slaughter showed lesions in the mesenteric glands. Smears from the milk now negative and the mammary gland normal, while a few organisms were found in the feces. I think that this case is a most convincing example upon which to base my above stated argument.

2nd—The time to retest: Up to the present I have not heard of any theory or explanation of the phenomenon of reaction outside of anaphylaxis. This consists of the presence in the body of protein splitting lysin specifically developed against the *Bac. tuberculosis* by the presence in the reactor of the toxins and organisms. When a dose of tuberculin is injected, this causes an anaphylactic reaction and the lysin stored up is used, hence it seems logical to believe that the proper time to make a retest is sometime hence when the production and accumulation of lysin has again occurred. The reaction following the retest by Dr. Jones may be due to only a partial use of the lysin in the first test; however that will not hold in every case, as another veterinarian and myself did some experimental work along this line several years ago which seems to prove this. We injected a large (double) dose of tuberculin into two reactors 5 and 15 days apart, respectively, with no reaction whatever. On postmortem the disease was demonstrated in both animals. On the other hand I have applied the retest to several, both reactors and non-reactors 60 days after the first test, and in the case of reactors have been able to prove up the reliability of this procedure.

TUBERCULIN TESTS.*

By DR. C. C. WALKER, Helena, Montana.

It is indeed with some hesitation that one takes up the subject of "Tuberculin Tests," as many abler men have discussed the various phases of this question. However, a few facts and data obtained during the last two years in tuberculosis eradication work may be of interest to you. As most of you know, my whole time has been given to this work since I came to Montana.

It is unnecessary for me to discuss the technic of either the subcutaneous or the intradermal tests. It may be well to state, in a general way, the manner in which a combination of tests

*Paper read before Montana Veterinary Medical Association at Butte, Mont., June 26-27, 1919.

can be applied to a herd with some show of getting the most out of each. We may also include the ophthalmic test, which, I am convinced, can be used under certain circumstances with excellent results.

From all the data I have been able to obtain and from my own experience, I would say that the intradermal test should have a clear field for at least 48 hours before the subcutaneous is used, if it is intended to use both on the same herd for the purpose of obtaining comprehensive results or as a check test, and should be used in herds which have not been recently tested, say within 60 days, by any test. As a general rule, to which there may be exceptions, the subcutaneous test may follow the intradermal in 48 or 72 hours or any longer period with good results. What little data I have would tend to show that the ophthalmic has no blocking effect on either the subcutaneous or the intradermal tests. On the other hand the ophthalmic seems to give more definite reactions when given with or following any of the tests. The second ophthalmic, when given about 48 hours after the sensitizing dose, always shows a more marked reaction than the first test. For this reason it would seem that we had a good agent in this test to pick out plugged reactors or to help decide between suspicious and real reactions to the other two tests.

When we wish to find out the real condition as to tuberculosis in certain herds we can use all three tests to good advantage. In our field work where our time is valuable and we want to get as much work done as possible, we can give the intradermal injection and insert ophthalmic disc at the same time. An observation of results of first ophthalmic is not essential, or not absolutely necessary, as same animals will show a more marked reaction to the second ophthalmic, when careful observations should be made. This reaction may be seen as early as 6 hours and, in some cases, as late as 18 hours after insertion of discs. We can give the subcutaneous test 48 or 72 hours after making intradermal injection and the insertion of first disc, taking the temperatures in the regular manner. The second ophthalmic dose, double the first or two discs, may be inserted at the same time the subcutaneous injection is made and observations can commence at the same time the postinjection temperatures are taken. If this method of procedure is followed no time is lost in waiting around and I believe the results will be excellent. I have not tried this

method many times so I make the statement with reservation.

The combination of these three tests will assist us in cleaning up herds with a bad history as we may be thus enabled to eliminate all or a larger proportion of the tubercular animals at the outset instead of waiting six months for a retest to remove tubercular animals which may pass the first test. It is an undeniable fact that some animals will pass any one of these tests and very frequently—too frequently for our peace of mind—some of these are spreaders and new animals will be infected before it is time for a retest under our rules governing the time for retests. On the other hand it is also true that we get apparent reactors to any of these tests as shown by our postmortem reports. We have been taught that the test was correct in about 98 or 99 cases out of 100. Those of us who have posted a lot of reactors know that the efficiency of the test is much less than has been supposed. Even so there is no other method anywhere nearly as good for eliminating the tuberculous cow. Therefore, if we can get a combination of tests, or can alternate the tests, we may get better results than we have in the past.

Some of the advocates of the intradermal test claim that 100 per cent of the reactors will show lesions on postmortem if the test is given by a well-trained man, and also if one does not find lesions he does not know how to give the test. I believe that neither of these things are necessarily true; that there are apparent reactors in non-tubercular cattle, in a very few cases, as there are with the subcutaneous and eye tests, and a few are passed by it as with the other tests. I base my opinion on the results of my own work and of the other men associated with me in this work. All of us will admit that there is a great difference as far as accuracy is concerned if we consider the work of a man who has made a large number of tests and has followed up his reactors with postmortems, as compared with the work of a beginner. Nevertheless it occasionally happens that a good man will find a nice typical swelling and fails to find any lesions. This occurs so seldom that it militates very little against the test. It may be claimed that the fault is always due to lack of careful search for lesions when we get these intradermal reactors as is usually claimed in similar cases of subcutaneous reactors.

We commenced to test for the accredited herd in this State in August, 1917, using the subcutaneous test. In most cases the herds we tested had been tested more or less regularly over a

period of years. For the most part these had been tested by the intradermal method during the three or four years prior to the accredited herd work. As a general rule the results of our tests were in agreement with the previous intradermal tests as far as one would expect to find from the individual history of the various herds. I shall now refer to some of the differences we found and will cite herds tested with one, or two kinds of test, and with a combination of tests.

HERD No. 1 (133 head Purebred Holstein).

History: Had been tested at least once a year and no reactors found for over six years. Both the subcutaneous and intradermal tests had been employed, the last test being intradermal. No untested animals had been admitted to the herd for some years.

Results: There were 5 reactors to subcutaneous test, one being slaughtered and no lesions found; the others passed later tests. The following is a chart of reactors:

	2pm	5pm	9pm	6am	8am	10am	12m	2pm	4pm	5pm	6pm	
1	1.2	1.8	1.2	2.4	3.6	4.8	4.5	4.4	3.7	3.4	2.0	
2	1.4	1.6	1.6	2.2	4.0	3.5	4.2	4.2	4.1	3.8	2.9	1.8
3	2.2	2.6	3.0	3.2	3.2		2.4	3.2	4.0	3.8	Continued	
				8pm	10pm	12m	5am	7am	9am			
				5.8	5.8	5.0	4.1	3.9	2.2			
				6am	8am	10am	12m	2pm	4pm	5pm	6pm	
4	2.2	2.6	3.0	2.6	2.8	2.8	3.0	3.6		4.1	Continued	
				8pm	10pm	12m	5am	7am	9am			
				3.4	5.4	3.1	2.3	2.2	2.0			
5-7 day retest,				3am	5am	7am	9am	10am	11am	1pm	2pm	3pm
2.0 1.6 1.4				1.0	2.0	2.7	2.8	4.8	5.6	5.2	5.5	4.9
				5pm	7pm							
				2.5	2.4							

Cow No. 1 slaughtered, no lesions.

HERD No. 2 (150 head Purebred Holstein, State owned).

History: The last reactors were removed 8 years previously and herd had been regularly tested up to time of our test, 4 times subcutaneously and 3 times intradermally. No untested animals had been admitted to herd.

Results: 2 reactors and 2 suspects found. One reactor and, by error, one suspect killed, no lesions found. See chart.

	2pm	5pm	7pm	5am	8am	11am	2pm	4pm	5pm	
1	0.8	1.8	1.8	2.6	3.3	3.9	0.6	1.4	1.6	Not killed.
2	2.2	1.8	1.8	3.2	3.8	3.6	0.6	1.4	Susp.	killed, no lesions.
3	2.0	2.0	2.4	2.8	3.8	4.2	2.4	3.8		
4	0.8	1.7	1.4	2.0	2.0	3.7	99.8	1.0	1.0	Not killed.

HERD No. 3 (18 head Purebred Holstein, State owned).

History: Reactors removed two years prior to our test, but no reactors on test one year before.

Results: 2 reactors, no lesions on postmortem. See chart.

	4pm	6pm	8pm	5am	7am	9am	11am	1pm	4pm
1	2.0	2.0	3.0	4.4	4.6	3.6	2.6	2.4	2.4
2	1.0	1.8	1.6	4.0	5.6	3.4	2.0	1.6	1.6

HERD No. 4 (70 head Purebred Holstein, State owned).

History: Had been regularly tested for some years and no reactors found, last three tests by intradermal method.

Results: 2 reactors, one of which was killed but no lesions found, and the other one year later tested during the same period with the subcutaneous, intradermal and ophthalmic with no reaction to any of these tests.

	2pm	5pm	9pm	6am	8am	10am	12m	2pm	4pm	
1	1.7	2.4	2.3	4.0	4.6	4.8	5.1	4.0	3.8	
2	0.6	1.2	1.7	4.5	5.0	5.2	5.8	3.3	3.0	Killed, no lesions.

HERD No. 5 (about 85 head mostly Purebred Holstein, State owned).

History: Had been regularly tested and no reactors found for over ten years. Same herd passed first test for accredited herd but found one reactor on second test. See chart.

	2pm	5pm	9pm	6am	8am	10am	12m	2pm	4pm	5pm	
1	1.8	1.6	2.2	1.4	4.0	3.2	2.4	2.2	2.2	1.4	Killed, no les.

HERD No. 6 (140 head Purebred and grade Holstein).

History: Had been tested about 2 years previously with no reactions.

Results: 3 reactors found on first subcutaneous test. Lesions demonstrated in one but not in other two.

Six months later on intradermal test 2 reactors found and these two were given subcutaneous tests 72 hours after intradermal, large doses, 15 cc., and both passed last test. Both of these cows were killed, one showing positive lesion and the other nothing definite macroscopically or microscopically.

	3pm	5pm	8pm	5am	8am	11am	2pm	4pm	5pm	
1	2.2	2.0	2.8	4.2	3.4	1.6	2.0	2.0		No lesions.
2	1.9	2.6	2.7	2.2	2.8	4.8	4.5	5.6	5.4	No lesions.
3	2.0	1.2	1.9	0.8	1.2	2.8	4.0	4.2	2.0	Lesions.
2nd test intradermal reactors injected 72 hours previously:										
4	1.8	1.0	0.6	0.6	1.8	1.8	2.0	2.0	1.4	1.2
5	1.6	1.8	1.8	2.2	1.8	2.4	2.0	2.0	1.0	0.8 0.6

HERD No. 7 (about 50 head Purebred Holsteins).

History: Had never found reactors on the place and herd tested about once a year for five years.

Results: An intradermal test showed two reactors; these were given the subcutaneous test about 96 hours afterward and neither showed any reaction. They were left in herd as they had not signed up for accredited list.

HERD No. 8 (69 head, mostly grade Jerseys).

History: No definite history of tests but owner said herd had been tested but no reactors found.

Results: 2 reactors to intradermal test, neither of which showed definite lesions.

HERD No. 9 (35 head Purebred Polled Durham).

History: Nothing definite as to tests but presence of tuberculosis was suspected.

Results: One reactor to first subcutaneous test, lesions on postmortem.

About 4 months later same herd tested intradermally and 8 reactors found, all of which showed lesions, three being generalized cases.

One old cow passed the first subcutaneous test and two subsequent intradermal tests, but reacted to third intradermal, was the worst case of generalized tuberculosis I ever saw.

About 6 months later the same herd was tested by the intradermal method and 7 reactors found. All of these showed lesions with one exception, and this cow had nice typical swelling.

HERD No. 10 (40 head Purebred Holstein).

History: This herd had been tested more or less regularly for two or three years and a few reactors were taken out from time to time. From all the results we have had in this herd it would seem that all or nearly all of original herd were plugged reactors at time they were shipped to the state in 1914. At any rate there were tubercular animals in the herd before its purchase by present owner. This may account for the fact that several of these cows passed the tests and that they had at time of our first test eliminated the effects of tuberculin injections.

Results: 16 reactors and 6 suspects on first subcutaneous test. All of the 16 showed marked lesions, 8 of them being condemned as unfit for food. The advice was given to also dispose of 5 of the 6 suspects at same time, but this was not done.

In about 3 months the whole herd was given the subcutaneous test and all passed, including the suspects. (Two calves reacted.)

In about another 3 months a subcutaneous test was given and two of original suspects reacted, the rest passing. These two showed well-marked lesions.

About 6 months later all three tests, the subcutaneous, the intradermal and the ophthalmic were given.

The intradermal injection was made about 3 p. m. on May 7, 1919, and the first ophthalmic inserted the same evening at 8 p. m. Observations were made the next morning at 6 and 9. Three cows showed suspicious reaction to ophthalmic. On afternoon of May 9, preliminary temperatures were taken and at 8 p. m. the subcutaneous injection was made, about 8cc. being given each cow, 15 to bulls, and at the same time two discs of ophthalmic tuberculin were inserted. The subcutaneous was given to eight cows and two bulls and ophthalmic to ten cows and the two bulls, one cow very near parturition and one having a metritis. The younger animals were given the intradermal only.

Observations and first temperatures were taken at 4 a. m. on May 10. Two of the cows suspicious to first ophthalmic showed marked reaction and the other one still suspicious. Both cows showing ophthalmic reaction also reacted to intradermal test; one had a very typical swelling but other was not very typical. There was no rise in temperature in one cow and the other showed a rise from 2.2 before injection to 3.5 after injection, or may be regarded as a suspect to subcutaneous test. This cow was one of original suspects and showed marked lesions of bronchial and mediastinal glands. The other cow showed a tubercular arthritis in one hock and a tubercular lesion in lung as big as a pigeon egg.

The other cow suspicious to eye test passed the intradermal test and on June 5-6 another ophthalmic and the subcutaneous test was given with no reaction.

As this herd now stands all of the older cows have been killed with one exception and she is one of the original suspects; the other suspect is 4 years old and is the one last tested in June. The bull was a suspect but was very hard to handle on the first test. He has passed all other tests.

It is fair to presume that we have removed the spreaders, as none of the younger cattle react to the later tests. It is advised that the bull and these two cows be slaughtered in case more valuable animals are to be added to the herd.

HERD No. 11 (about 125 head Purebred Holstein).

History: This herd was imported into the state from three Eastern States and was tested before being shipped, some six or

seven years ago. Two or three years passed before they were tested in this State. The history goes back to November, 1916, when the first test was made.

Results: First test, intradermal, November, 1916: 74 tested (milk cows), 27 passed, 9 suspects, 38 reactors, 52 not tested.

Owner wanted subcutaneous test and the herd was given this test in January, 1917; 122 tested, 72 passed, 8 suspects, 41 reactors, 4 not tested.

Original intradermal reactors kept in quarantine but included in this test.

Forty of the 41 subcutaneous reactors were posted and lesions found in 39; the other, which was suspicious to the intradermal but reacting to the subcutaneous, showed no lesions.

A comparison will show that 20 intradermal reactors either passed or were only suspicious to the subcutaneous test. Out of the 27 passed by intradermal, 4 reacted and 1 was suspicious to subcutaneous test. Out of the 38 reacting to the intradermal test 13 passed the subcutaneous, 6 were suspicious, one not tested, and of those suspicious to the intradermal 2 were passed and one suspicious to both tests.

Third test: Subcutaneous May 1917; 93 tested, 64 passed, 7 suspects, and 22 reactors.

The former intradermal reactors (20) were in this test. Of these 20 intradermal reactors 14 passed this test.

The 22 reactors were posted and all showed lesions. Nine of the 14 former intradermal reactors passing this test were also posted, all showing lesions.

Fourth test: January, 1918, subcutaneous: 73 tested; 50 passed; 10 suspects; 13 reactors.

The 5 remaining intradermal reactors were in this test and a dose of 15 cc. was given to each cow. One reacted, two were suspicious and two passed the test.

The 13 reactors, one being former intradermal reactor and also reacting to this test, and the remaining 4 intradermal reactors, making 17 in all, were posted, all showing lesions.

Fifth test: Intradermal: April, 1918: 61 tested; 2 reactors, the same animals also reacting to the ophthalmic which was given at same time. These two reactors showed lesions.

Sixth test: Subcutaneous: 39 tested, 1 reactor. September, 1918. Reactor showed lesions. Some young animals not tested.

Seventh test: Subcutaneous: November, 1918, 58 tested, no reactors.

Eighth test: Intradermal: March, 1919, 81 (including calves) tested; no reactors; no suspects.

NOTE: There was one 11-year-old cow which had lost condition; this had been noticed for 4 or 5 weeks, and this led to the supposition that she was suffering from tuberculosis and for this reason she was given, besides the intradermal, the subcutaneous, the first and second ophthalmic and the intrapalpebral tests, but failed to react to any of them. As cow was about to die she was posted and it was found that she was suffering from acute nephritis, but a close examination of the glands revealed several tubercular nodules in one bronchial gland. These were apparently of the healed variety. This cow had passed all tests given the herd.

We have killed over 100 animals out of this herd and it is probable that we have it cleaned up as far as tuberculosis is concerned. A combination of tests will be of value in making the next test of this herd.

In order not to have all the data on one side I should like to refer to one herd of Purebred Polled Angus cattle of 82 head which were tested by the subcutaneous method, 40 reacting and lesions being found in 39 head of these. In this case all suspects were called reactors with owner's permission. One suspect did not show definite lesions.

Another herd of Shorthorn cattle, 170 head including calves, were tested by the intradermal method, 56 reacting; all of these, with one exception, showed lesions on post mortem. The last two herds were posted in Butte and Billings respectively under B. A. I. supervision.

In one of the largest herds tested, about 750 head, these were tested by the intradermal method; there were 170 reactions. All these animals were killed under B. A. I. supervision, part of them in Butte and part of them in Chicago. About 100 head were shipped to Chicago under the new quarantine law last fall, and all showed lesions except 4 or 5 head.

A careful consideration of the facts presented will convince one that we have something to learn about tuberculin tests. It is almost impossible to draw definite conclusions from these various and conflicting data. It would seem that in some herds the intradermal test was more efficient than the subcutaneous and in

others it was about the same with either test. In any herd with a large percentage of tuberculosis, no recent tests having been made, either test is very accurate when applied by trained men. In herds which have a fine history, and which would seem to be entitled to a place on the accredited herd list, we may get a very few supposed reactions to any of the tests.

It would seem that we have a valuable agent in the ophthalmic test to check up the findings of the other two tests. This can be used in herds having a large number of reactors and in herds which have been clean and in which we get reactors or doubtful reactors and want to find out the real facts.

TUBERCULOSIS ERADICATION IN PENNSYLVANIA.*

T. E. MUNCE.
Harrisburg, Pa.

In Pennsylvania, herd owners have two methods to choose from in eradicating tuberculosis. In brief, they provide as follows:

1st. Officially Accredited Herd Plan. Coöperatively between Federal and State Bureaus to establish throughout the United States what is known as Officially Accredited Tuberculosis-Free Herds. To secure this coöperative assistance, the herd owner must comply with the requirements contained in the agreement between the United States Bureau of Animal Industry and Pennsylvania Bureau of Animal Industry. The examination and tests are conducted at stated intervals by Federal and State Bureau agents free of charge. The owner is partially indemnified for condemned cattle by payments from Federal and State Bureau funds as available by legislative appropriations. In some instances payments are deferred until moneys are available; but there has been no default of payment. Condemned cattle are appraised at market value as agreed between owner and agent. The law limits the payment of indemnity by the State to \$70.00 for a registered and \$40.00 for an unregistered animal. In addition to the amount paid by the State, the Federal Bureau may pay not more than \$50.00 for a registered and \$25.00 for an unregistered animal. The law limits the amount the owner may receive from all sources, *i. e.*, the State, the Federal Govern-

*Presented at Annual Meeting of the Pennsylvania State Veterinary Medical Association at Harrisburg, Penna., January 22, 1919.

ment and the butcher, to 90% of the market value as established by the owner and State agent.

2nd. Unofficial Plan. The owner may arrange for the testing of one or more animals, or the entire herd, but no indemnity will be paid and the owner is under no obligation to continue the testing. Examinations and tuberculin tests are conducted at owner's expense, by a veterinarian selected by the owner, provided such veterinarian has been approved by the State Bureau. All tests must be reported promptly and the condemned animals handled according to law. This plan is to take care of herd owners who are unable or unwilling to obligate themselves under any prescribed plan in the effort to rid their herds of tuberculosis.

The first formal application under the officially accredited plan was received April 1, 1918, four months after the plan was adopted at Chicago. We have not been pushing this proposition vigorously by urging our breeders to test their herds. Had we done so, we could have had many applications to report today. We do not deem it good policy to urge tuberculin testing upon our farmers, believing it far better to be content with the policy of calling their attention to the economic losses that result from neglecting to check the progress of tuberculosis in their herds and to acquaint them with the best known methods for detecting and eradicating the disease.

We have in Pennsylvania approximately 1,532,000 cattle with an estimated value of \$101,176,000 which, in the speaker's opinion, is low. Of that number, 914,000 are said to be milk cows, estimated to be worth \$75,000,000, which is certainly conservative.

In the herds tested under the officially accredited plan, 5% were condemned. Granting there are 1,000,000 milk cows in the State and 5% are tuberculous, we had last year in Pennsylvania 50,000 tuberculous cattle with an assessed value of \$72.90 each, or \$3,645,000.

A further insight as to the waste resulting from tuberculosis may be gleaned from the records of post mortem examinations made by Federal and State agents at establishments in Pennsylvania outside of Philadelphia and Chester. These records show that out of 100,000 cattle killed under inspection, 3,273 (3¼%) or 131 car loads were diseased; 1,076, or one long train of 44 cars, were so badly diseased that they had to be tanked, and tubercu-

losis is spoken of as a preventable disease. The records for Philadelphia, our largest slaughtering center, and Chester were not available, but had they been obtained they would have shown the losses even more appalling. Another thing to remember is that these figures represent only approximately one fourth of the cattle slaughtered in Pennsylvania. Furthermore, keep in mind that the worst cattle are, as a rule, killed at establishments at which no inspection is maintained and data, therefore, is not available.

The foregoing figures relate to cattle alone and do not include losses from tuberculosis in hogs.

If we accept the foregoing as true, then we are confronted by the question: Is it worth while, economically, to attempt to check this disease? I say economically because everything industrial, social, and even moral, it seems, is reckoned nowadays in dollars and cents. The public wants to know, and rightly too, what a thing will cost and what it will yield when produced. The question, then, is one of production and preservation. Does it pay to produce livestock? If your answer is affirmative, then it will pay to preserve it. If a thing is worth producing, it is equally worth preserving. If a product is not worth preserving, it is not worth producing. The two go hand in hand, we cannot get away from that. The laws of nature teach that and we see it on every hand.

Some oppose the tuberculin test as a practical proposition, on the ground that it is not accurate and suggest postponing the work until a perfect diagnostic agent is brought forth. Such a theory may be good, but do such advocates apply this principle to other things? We think not. They use, as a rule, the best agent available. I say as a rule because they do not always take advantage of the best, being willing at times to use a substitute for the best, the almost as good product. If our home caught fire we would not inform the fire department to keep hands off just because they failed to extinguish every fire in the community. If our wife or child contracted a dangerous, infectious disease, we would not refuse to call our physician on the ground that some of his patients had died from the same malady. We do not refuse to ride on trains because of accidents. We do not dispose of our automobile because of occasional carburetor or tire trouble. Those of us who have had anthrax or blackleg among our cattle do not refuse to vaccinate annually against these diseases because

the vaccine occasionally fails to produce the desired immunity. We do not refuse to have anti-hog cholera serum administered because, in a previous outbreak, some of the vaccinated hogs contracted the disease and died. Our grain binder occasionally misses tying a sheaf, yet we do not discard it and return to the reaper or cradle and tying by hand. These agencies, like hundreds of others, are not perfect by any means, yet we constantly employ them. Why? Because they are the best at hand. They are practical illustrations, matters of daily occurrence, yet we take little, if any, account of the failures, but continue to use such agencies as we have, imperfect as they are, almost in full confidence and as though they were exempt from liability to mistake.

For this there is a reason. Is it not because we see for ourselves the disaster that will follow and the losses which will be sustained if a remedy is not applied? Is it purely a matter of understanding application of the theory that seeing is believing? If our power of vision were increased to a degree that we could determine by the naked eye, see for ourselves whether our cattle are tuberculous or healthy and, if diseased, we could observe the progress of the malady from day to day, most herd owners would have a different vision of this important problem. As it is, the disease is hidden and we cannot observe its presence; moreover, its progress is usually slow, which further obscures its prevalence. If the breeders and feeders could be present at the slaughter of the cattle and hogs they raise and dispose of, they could then see for themselves the seriousness of the disease, get a better conception of the enormous losses and waste that take place yearly in our livestock industry.

It has been suggested that the time will come when the farmers who breed and raise the livestock will be called upon to bear the losses resulting from animals killed for food and condemned on account of disease instead of the butchers, as at present. As to whether this is the proper time to advocate such a policy, we are not prepared to say, but some day such rule or law will undoubtedly be adopted. When the time comes for the breeders and feeders to make good such losses, then, and not until then, will our people as a whole, appreciate the seriousness of the situation and realize that it is to their individual financial interest to give closer attention to the health of their stock. When the pocket book is touched, relief will be sought and a real and

united effort made to produce and maintain healthy herds. This, then, is no time to stop and loiter by the wayside. We must keep going at full speed. The ravages of disease and the waste which follows must be checked and such men as you must help to do it. If it was necessary, in the midst of the war, to stop waste and speed up production, it is, my friends, even more essential to do so now during the years of reconstruction. We have more people to help feed today than during the war or in the history of the world.

To those who advocate waiting until an absolutely accurate diagnostic agent is discovered before starting tuberculosis eradication, the answer is: No, the people are not willing to wait. Such a procedure is not in accord with the Yankee's way of doing things. We all know that when American citizens recognize the existence of a menace, they want to get rid of it as soon as possible and, to do so, they employ the best methods available. It is not the history of this country for its people to stand back and wait for the infallible—the dawn of a perfect day. They take the best at hand, use it and while using it, they perfect it.

We are not boosting this work. Tuberculosis eradication is forced upon no one. In Pennsylvania, tuberculin testing is now and always has been optional with the cattle owner and, furthermore, so long as we have anything to do with formulating the livestock sanitary policies, it will remain so.

The accuracy or inaccuracy of the tuberculin test is not, in our judgment, the basis upon which the question of bovine tuberculosis should be considered and discussed. The tuberculin test should be regarded incidental rather than paramount to the main issue. If we ever expect to successfully eradicate the disease in this country, it will not be sufficient to confine the work to removing diseased animals from the herds but the effort will have to be in the direction of building clean herds from healthy offspring. Remove the cause by breeding and raising healthy stock and not wait until the disease appears, then undertake to eradicate the trouble. In other words, build your herds from healthy foundation stock and surround the young with fitting environment as they grow into maturity and you will have done more toward solving the tuberculosis eradication problem than all the tuberculin testing that has been done on mature animals which have been kept under unsuitable and haphazard conditions. Go almost where you will and you will see the calves shifted

here or there to suit the convenience of the owner, unusually back in an out of the way corner where fresh air and sunlight seldom, if ever, reach.

Discontinue the practice of keeping the calves and other growing cattle in the same building with mature animals. Provide separate quarters including exercise yard or runway for the young cattle. These quarters should be situated, if possible, on ground with natural drainage. The side or end of the pen facing the south should not be enclosed. This will allow the cattle to go and come as they please and will permit the entrance of sunlight and fresh air, and last, but not least, they should have constant access to plenty of pure water, all of which are indispensable to good health. Cattle matured under such conditions will enter the milk line or feed lot in sound health and with a sturdy constitution sufficient to withstand the strain incident to the present forced method of milk and beef production and which will better enable them to ward off the common diseases cattle are heir to.

Tuberculin is an important factor in speeding up tuberculosis eradication work and in protecting our herds against outside infection, but most important of all, the essential thing is to breed and raise our herds under healthful environment. In districts of America where cattle are raised in the open, bovine tuberculosis is rare as compared to sections in which they are closely confined in poorly ventilated dark stables, as for example, most of our eastern bank barns. Do not understand me as condemning or even belittling the tuberculin test, because we have as much faith in the virtue of the test as ever. It is unquestionably the most accurate diagnostic agent available, but like all other human agencies, it is not infallible—it has its limitations. Unfortunately, most people, including many veterinarians, expect too much from tuberculin. They look upon and use it as sort of a cure all for tuberculosis. They apply a test, then go about their ordinary business affairs until it is time for another test. In short, they depend entirely upon tuberculin and ignore the truly essential things: breeding, feeding, sanitation, etc.

Tuberculosis eradication is a business proposition and any herd owner who is not prepared or is unwilling to carry on the work as such, and with a determination to succeed, had better leave it alone. To herd owners who have studied the proposition and see that it is to their interest to have healthy herds,

we are ready to cooperate with such owners to our fullest ability and with a resolution to win. To those who are interested but undecided and desire additional information, we will most gladly counsel with them at their convenience.

Permit me to say in closing that in tuberculosis eradication we may postpone the day of reckoning, but we cannot avert the imposition of the penalty. Bovine tuberculosis has got to go from our fair land. Your counsel and advice in perfecting plans for carrying on the work is most earnestly solicited.

THE STATE LAW RELATIVE TO THE PHYSICAL EXAMINATION OF CATTLE.*

VERANUS A. MOORE, Ithaca, N. Y.

Section 98, Chapter 311, of the Laws of New York, as amended and approved by the Governor May 3, 1919, contains the following provision for the physical examination of dairy cattle.

"The Commissioner shall cause a physical examination to be made by competent veterinarians of dairy cows whose milk is marketed in liquid form or manufactured into butter, cheese or other food for human consumption, where the conditions are such as to make it necessary, in order to prevent the products containing pathogenic bacteria, and he may cause a bacteriological test to be made of the excretions or secretions of any herd or herds of dairy cows or of any cow or cows within the state. Such physical examination may be made as frequently as available funds appropriated will permit and as the conditions may necessitate."

This law was enacted on the recommendation made by the New York State Commission for the Investigation of Bovine Tuberculosis appointed by Gov. Glynn and which made its report in March, 1915. This Commission was appointed for the purpose of ascertaining, if possible, what changes should be made in the law that would reduce, or tend to minimize, the amount of bovine tuberculosis in the state. The Commission consisted of 19 men†, deeply interested in the control of this disease. Their

*Read at the meeting of the New York State Veterinary Medical Society, July 24, 1919, Brooklyn, N. Y.

†Theobald Smith, chairman, Henry L. Best, Herman M. Biggs, Albert L. Brockway, Herbert E. Cook, Parker Corning, James A. D. S. Findlay, Calvin J. Huson, O. U. Kellogg, Henry H. Law, V. Everett Macy, Albert Manning, Veranus A. Moore, Henry L. K. Shaw, Edward Van Alstyne, Philip VanIngen, H. J. Wright, Linsley R. Williams, Secretary.

recommendation on physical examination took the form given in the statute referred to in 1917. The economic conditions occasioned by the war prevented the Commissioner of Agriculture from enforcing this statute until after the armistice was signed and then his appropriation was insufficient to carry it out in full.

This subject received very careful consideration by the Commission and the recommendation was voted unanimously. It was agreed by all that this measure would be beneficial in combating bovine tuberculosis. It was not intended as a substitute for any specific test nor does it change in any way the law relative to the use of tuberculin. When it came to the enforcement of this statute, the question arose as to whether or not such a procedure would be of sufficient value to justify it. The objectors based their argument on the fact that it was impossible to detect a very large percentage of tuberculous animals by a physical examination, and that after all the suspicious cases were removed, that could be detected by it, there would still remain many infected individuals. Some of those, who oppose the measure, feel it is unwise to employ a method of this kind when, as they say, there is a more efficient means of detecting infected animals, namely, the use of tuberculin. As those who have questioned its efficiency are, so far as I know, veterinarians, it seemed desirable to point out some of the benefits it was believed would accrue from its enforcement and, further, to emphasize the importance of physical examination and the part it can play in control.

From statements that have been made, it appears that some veterinarians are experiencing difficulty in understanding the value and limitations of the various methods for the detection and control of bovine tuberculosis. With the development of newer methods for diagnosis, there is a tendency to put aside procedures heretofore employed. Many members of the medical professions seem to have forgotten that the physical examination formed the basis of all diagnosis in the earlier years and, more than any other method, continues to bring into operation the power of observation and the skill of the practitioner as distinguished from those of the herdsman. If one turns to the early history of veterinary medicine, he will find that by this method quite remarkable achievements have been accomplished. In the Fourth Century, for example, Apsyrtus, the official

veterinarian of the Roman Army, diagnosed glanders by the physical examination alone; and by isolation and quarantine brought it under complete control. In the latter part of the last century, Dr. James Law diagnosed tuberculosis in one of the large state herds and by repeated and thorough physical examination and the removal of suspicious animals, eliminated it. For a number of years after tuberculin came into use, not a reactor was found in the herd. It is to be regretted that this foundation to the art of medicine should be surrounded by so many doubts and misgivings because, with greater knowledge of infections, we recognize that at any one time, all of the infected individuals cannot be detected by it. This condition has always existed. It is in America alone that veterinarians have tended to abandon this fundamental method for detecting disease and apparently for the astonishing reason that it is not one hundred per cent efficient.

In the rapid succession of new knowledge of infections, and special methods for their identification, there is a tendency to accept the last discovered test as the most reliable means of diagnosis. Already there are filed on our shelves the descriptions of many such tests that have been excluded from regular routine because of their limitations. Again, one cannot follow the evolution in diagnosis without recognizing how quickly an apparently satisfactory procedure becomes, for the best results, dependent upon some subsequently discovered or devised method of precision. Accurate diagnosis has become more and more difficult. In this country, there has come to be more or less confusion in the profession as to what is meant by physical examination and clinical diagnosis. It has become a habit of certain veterinarians not to differentiate between these two, and, what is more appalling, to look upon certain specific "tests" as being separate and distinct from either of them. As did the artists of old, so let us return to the teachings of the masters and see what is meant by each of these methods for detecting and identifying morbid conditions and infections.

The term physical examination means the systematic study of the various parts of the animal body by means of the ordinary senses. This was the only method known to the ancient veterinarians and to the veterinary profession as such from the time of Claude Bourgelat to the dawn of the newer pathological procedures more than a hundred years later. During this time, all

knowledge of specific diseases and their differentiation, one from another, was based on the findings of a careful examination of the body. There developed methods or systems of physical examination consisting of the orderly arrangement of the knowledge of the normal organs. No one, who has carefully analyzed the "Outlines of Clinical Diagnostics" by Malkmus, will fail to understand or appreciate the significance and comprehensiveness of this examination. In applying it, one examines each system of organs in the body, such as the respiratory, circulatory, digestive, nervous, etc., so that when he has finished, he knows whether or not there is any deviation from the normal in any part of the body that can be detected by the human eye, hand, or ear. It is self-evident that to be able to make these examinations, the examiner must be thoroughly familiar with anatomy and the functions of each of the organs.

As disease is a variation from the normal, it is evident that before one attempts to determine a morbid condition, he must know what the healthy organ is like. The physical examination enables one to ascertain by means of inspection, palpation, percussion and auscultation whether or not the normal condition exists. If it does not, there must be abnormal changes. It is possible, therefore, if there are deviations, to ascertain in what system and in what part they are located. The ability to make an efficient physical examination is one of the most difficult, and at the same time, most important acquisitions for the practitioner of either human or veterinary medicine. In the great schools of Europe, the teaching of this subject occupies a prominent place in the curriculum. In this country, on the contrary, we sometimes hear both practitioners and teachers of veterinary medicine refer to it with an air of contempt. The essential difference between the great clinicians and the average practitioner is the superior ability of the first to make a physical examination.

With the development of definite knowledge of the etiology and tissue reactions to invading organisms, methods have been devised for making positive identifications. These supplement the findings on physical examination and constitute clinical diagnosis. Clinical diagnosis, therefore, means the finding of morbid conditions on physical examination and identifying their nature by any means or tests that science has brought forth that may be applied to the living animal. Among these may be

mentioned the microscopic examinations, chemical analyses and specific reactions. The terms physical examination and clinical diagnosis are used often erroneously as synonyms. It is well to recognize that they may be likened to two variables, gradually approaching the same limit.

The purpose of the physical examination is now, as it always has been, to find any abnormal condition that can be ascertained by means of the trained senses. This naturally brings up the question as to the degree of accuracy of such examinations in (1) finding morbid conditions and (2) identifying any particular disease. In acute troubles, there are symptoms accompanying the lesions that aid materially in the identification of the trouble. In chronic maladies, however, they are more often absent. It is clear that a careful examination of the lymphatic system would indicate whether or not one or more of the glands, located beneath the skin or in reach by a rectal examination, are enlarged. It is impossible, from this fact alone, to state the specific cause for the enlargement. The same would hold with abnormal findings in other systems such as dullness on percussion or rales on auscultation. If, however, the morbid changes are well defined, they usually take on a form that is more or less characteristic of the disease with which they are associated. This, however, is not always true for frequently diagnoses based on such an assumption, prove to be erroneous. There are certain specific diseases such as tuberculosis, actinomycosis, glanders and some others that can be determined in a very large percentage of cases by the physical examination when the tissue changes have advanced to a certain stage. If the nature and general course of each of these diseases is understood, it is possible from the location and general character of the lesions, to be reasonably sure of the particular disease present. The degree of accuracy of such a diagnosis is determined necessarily by the knowledge of the disease possessed by the examiner and the relative frequency of other causes giving rise to apparently like manifestations.

In most cases where the physical examination indicates an abnormal condition, positive diagnosis depends on evidence obtained by certain supplemental methods, such as the tissue changes, the detection of the etiological factor or the presence of some specific reaction. The diagnosis, therefore, by physical examination, at least in cases of specific diseases, is presumptive.

This presumptive diagnosis stands in exactly the same position as many laboratory presumptive tests. For example, in the bacteriological analysis of water, the fermentation of certain carbohydrates with the production of a definite quantity of gas and acidity are presumptive evidence that the colon bacillus is present. The finding of acid fast bacteria in the microscopic examination of milk or excreta would be presumptive evidence of tuberculosis; a normal temperature in a certain percentage of cattle following the use of tuberculin is presumptive evidence that such individuals are free from tuberculous infection. Yet, no one familiar with these subjects would be willing to accept as positive the accuracy of the presumptive tests without more definite determinations. In like manner, the presence of obvious tissue changes, suggestive of tuberculosis, such as enlarged subcutaneous lymphatic glands, a hard and indurated udder or pronounced pulmonary disturbances, warrant the same degree of consideration as other presumptive tests which are accepted as sufficient evidence for action in every health department in the country.

However, the question at issue is to what extent can bovine tuberculosis be detected and controlled by a physical examination. As the first element in control is diagnosis, the question resolves itself into the accuracy of the physical examination in detecting disease. As the lesions are usually local and spread with varying degrees of rapidity, it is obvious that their presence cannot be detected in more than a small percentage of infected animals at any one time. In certain tuberculous herds, it may be impossible to find any of the infected individuals, especially if the tubercles are in the mesenteric glands, spleen or other deep seated organs. In most cases where lesions can be detected a positive identification is impossible without confirmation by some of the agents included in clinical diagnosis such as a bacteriological examination or the application of tuberculin. In other words, the physical examination makes possible a presumptive diagnosis in all cases where lesions can be located.

The significance of the physical examination is not measured entirely by the percentage of infected individuals it will detect but rather that the cases which can be found by it represent the more dangerous animals, that is, those that are more likely to be eliminating tubercle bacteria or are liable, in the near future, to do so. It is not presumed that it will detect all cases

that are spreading infection but it is known that it will find many of them and, if properly made and repeated at short intervals, it will single out in a reasonable time many of the infected animals before the lesions approach the stage where they can spread the specific organisms. If all such animals are removed, the chances for the sound cattle in the herd to escape infection are increased. Both Ostertag and Poels have assured me that, if carefully applied, a system of physical examinations with the removal of the suspicious cases, will check the spread of the disease and allow healthy calves to be grown up to take the place of the diseased adults. The physical examination cannot detect the occult cases and undoubtedly many of them, in which pulmonary lesions are discharging tubercle bacteria, cannot be found. If, however, it is supplemented, in herds where there is evidence that there are spreaders, by one or more of the clinical methods such as sputum cup or tuberculin, the dangerous individuals most likely will be detected. It was the intent of those who recommended the physical examination that in practice it should include all that could be hoped for in the clinical diagnosis. It was well understood by the Commission that this method would find, on any single examination, but a small fraction of the animals that were actually infected but that repeated examinations would detect them as they developed and, it was hoped, before they became spreaders.

It is clear to all who have studied or worked with tuberculosis that the use of tuberculin has been somewhat of a disappointment as the sole diagnostic agent in official methods of control. Again, the numerous theories and opinions regarding the nature of tuberculosis, that have found their way into popular bulletins, have prejudiced many people against using it. For these and perhaps other reasons, certain cattle owners have become indifferent to any and all efforts to detect and eliminate tuberculosis.

The great advantage of the physical examination is its educational value. If the statute is enforced, it will bring all owners of tuberculous herds in the state in contact with their veterinary advisers. If the latter are men possessed of a true professional spirit, they will utilize this opportunity to instruct their clients regarding the nature of the disease and the procedure that should be followed to purify their herds. They can explain the things that are essential and necessary in maintain-

ing tuberculous free herds and they can guide their clients in the disposal of diseased animals in such a way that they will cause the least loss and also do no further damage. The authority of the law creates a channel of friendly approach, a means of cooperation and an opportunity for veterinarians to gain the confidence of the farmers. The eradication of tuberculosis can never be accomplished without the desire of the owners themselves to have sound herds and their active cooperation in the work. By establishing this point of contact, the law has given the practitioners an opportunity to be the educators and advisers of cattle owners in all matters pertaining to the control of this disease. The prevention and eradication of disease is the principal reason for which the veterinary profession exists. The prevention and eradication of tuberculosis will be accomplished through the agencies of technical knowledge applied through professional service rather than by legislation. The introduction of the accredited herd plan and the value commercially of the sound herd, are helpful agencies to assist the veterinarian in accomplishing this purpose.

It should be clearly understood that the law calling for a physical examination of the dairy cattle of the state is to supplement the tuberculin and other specific means officially recognized for the detection of diseased animals and not to replace them. Experience has taught that there are many and serious limitations in the value of tuberculin. But recently, I knew of the testing of seven animals with it. Two reacted and five did not. Of these, three were condemned on physical examination and all five were tuberculous as shown by the post mortems. Not long since, a dairy that was being tested annually, yielded a large number of reactors each year. When physical and clinical examinations were made, a cow that had repeatedly failed to react to tuberculin was found to be eliminating tubercle bacteria in her sputum. After her removal, no further cases developed. These may be exceptions but they emphasize the fact that in the detection of infected and diseased animals, it is not safe to depend entirely upon any one method.

In the control of tuberculosis, we have to deal both with the infected and the diseased animals. There are at least three well defined procedures for detecting tuberculous individuals, namely: (1) the physical examination; (2) the use of tuberculin; and (3) the bacteriological examination of excreta, the sputum

cup method being the most valuable for pulmonary cases. There is no way of detecting the recently infected animals, that is, before the tubercles begin to develop. To eliminate the disease quickly, all of the known methods are required. Each procedure has its special significance and should be accepted for what it is worth and no more. The physical examination enables the examiner to ascertain:

1. The advanced cases of tuberculosis.
2. Supplemented by the bacteriological examination, it enables him to detect practically all animals that at the time are eliminating tubercle bacteria.*
3. The skilled examiner can detect the location of lesions in a large percentage of less advanced cases so that the suspicious animals may be removed and the disease positively diagnosed by clinical agencies.
4. It will teach the cattle owner that there may be, and often there is, a direct relationship between tuberculosis and unthriftiness, chronic bloating, low production, "bad quarters," chronic cough, sterility and other miscellaneous ailments to which other causes are usually assigned.
5. It fixes the minimum requirement that Public Health interests should place on all cattle that produce market milk. The health authorities of every community should insist upon this examination being made in as thorough a manner as possible.

The physical examination has certain marked limitations, namely:

1. By it, the examiner cannot detect more than a small percentage (1 to 5) of the infected animals at any one time. For this reason, its value is restricted to the control of the disease within the herd.
2. As the occult cases cannot be detected by it, it is of little value in interherd control.

Tuberculin is undoubtedly the most efficient agent known to medical science for detecting tuberculosis. Its value is epitomized in the following statements:

1. When tuberculin is properly made and applied and a reaction to it follows, the individual can be considered tuber-

* Tuberculosis resembles weeds in a garden. If one pulls up every weed as soon as it comes in evidence and before it goes to seed, the garden will become clean eventually. Likewise, if every animal in a herd infected with tubercle bacteria is detected and removed before it becomes a spreader or "goes to seed", the disease will, in a few years, be eliminated. It is in allowing infected animals to "go to seed" that keeps tuberculosis flourishing.

culous. The reaction is, so far as known, positive evidence of the existence of tuberculosis.

2. It will produce a reaction when the tissue changes are slight and consequently it is of inestimable value in detecting early cases.

The failure on the part of the animal to react to tuberculin, however, is not positive evidence that the disease is absent. A long experience in its study and use has shown that it has certain limitations which are referable to (1) the preparation of the tuberculin itself; (2) its improper use and the failure to interpret the reaction it produces and (3) the failure of the tissues in certain cases to respond to it. The limitations may be stated categorically as follows:

1. All strains or cultures of tubercle bacteria apparently do not make an efficient tuberculin.

2. When the cultures of tubercle bacteria, to be used in making tuberculin, are not properly grown, that is, when there is too much liquid in proportion to the surface area, the liquid does not contain an adequate quantity of the specific products of the organism to enable it to produce a reaction.

3. When, in the application of tuberculin, the observations of the person making the test are insufficient to detect the response to it, the reaction is missed.*

4. When the interpretation of the manifestations following the use of tuberculin is not made in accordance with (1) normal physiological variations and (2) the laws governing the reaction, it may be misleading.

5. When tuberculin is applied in the period of incubation, a reaction cannot take place. Later when the tubercles begin to develop, the animal will react.

6. When the tuberculous lesions are arrested, healed, encapsulated or when they are very extensive, tuberculin sometimes fails to produce a reaction.

7. After tuberculin has been administered repeatedly, a reaction is liable not to follow a further administration of it.

The bacteriological examination for the specific organism, while forming the basis of the so-called Manchester method of

* The usual time for the temperature reaction to occur, after the injection of tuberculin, is between the sixth and tenth hour. The elevation continues for from six to twelve hours thereafter. Occasionally, however, reactions take place very early and sometimes they do not begin until from eighteen to thirty-six hours after the injection. See article by J. G. Wills and Chas. Lynch on "Delayed Reactions following Injection of Tuberculin." Report U. S. Live Stock Sanitary Association, 1913, p. 78.

combating the disease, should be utilized not as an independent method but in conjunction with the other procedures. It involves too much labor and expense to be applied generally and, like the physical examination, it would not detect animals with lesions in deep seated organs and, like tuberculin, it would very likely allow the arrested cases to escape.

When all the facts and principles involved in the complex question of the detection, prevention and eradication of tuberculosis are considered; and the auxiliary factors connected with it are taken into account, I am of the opinion that Section 98 of our Agricultural Law was not only justified but also that it offers the greatest possible opportunity for accomplishing results that can come with a single procedure. For this reason, the veterinary profession should do all it can to assist in the enforcement of this law. No one claims that it is anything more than a distinct part of the great composite of physical and clinical methods required to detect infected and diseased animals. The problem before us is to eradicate tuberculosis. Theoretically, the law requiring physical examination is well founded but if it has weak places, they will not be found until it has been put to a fair and just trial.

THE FUTURE VETERINARY CORPS OF THE ARMY.

By MAJOR C. D. MCMURDO,
Veterinary Corps.

With the prospect of the adoption during the fall months of legislation for the reorganization of the Army, it would seem wise for the veterinary profession to consider carefully some of the possibilities which this legislation may hold for veterinarians in the military establishment.

Under the provisions of the National Defense Act of June 3, 1916, the army veterinarians were given for the first time the rank of commissioned officers and the Veterinary Corps made a part of the Medical Department. It is understood that this move was with the tacit consent of the Quartermaster General. The work of transferring the officers in their new affiliation was barely completed when the United States entered the war and no organization had been completed. Consequently the Veterinary Corps under the Medical Department is only about two years old. With all the stress of actual warfare during

this period it has of course been practically impossible to organize and develop the Veterinary Corps along the broad lines which could be followed in quieter days of peace. Emergencies had to be met as they arrived, leaving many questions of policy and procedure to be worked out when time should permit.

Notwithstanding these facts there has been apparent in certain quarters considerable agitation as to whether change in the affiliations of the Veterinary Corps is not advisable when Congress legislates for the new army. Several moderately well defined plans appear to have been suggested.

First. That the veterinary service be organized and kept a separate Corps.

Second. That it be united with the remount organization under a common head into a new Corps.

Third. That it become a part of the Quartermaster Corps.

Fourth. That it remain a part of the Medical Department as at present.

In the nearly thirty years that I have been connected with the army as a veterinarian, and more particularly during the past eighteen months in which I have served in the capacity of a general veterinary inspector, I have had an opportunity to study the work of the Corps, and perhaps understand its possibilities as well, or better, than any one who remained on this side of the Atlantic, and the arguments for and against these plans present themselves to me in the following order:

There is perhaps no more pleasant vision than that of the Veterinary Corps as an independent organization, with its own brigadier general and staff, its own training camp and school, its enlisted personnel, and its duties clearly defined, with every member of the Corps working for the common good. However, no one who has had any experience with the military establishment, believes this vision can become a reality.

Military history shows a constant repetition of the struggle for existence by the small organization and for supremacy by the larger one. "The survival of the fittest" has been written many times over in the Army. It is doubtful whether as a separate Corps the veterinary organization would last a fortnight. Perhaps a typical illustration of what is meant may be found in the history of the old Commissary Department. This Department had its birth during the Civil War, when, because of the need for greater efficiency, the Commissary was separated from the

Quartermaster Department. It had its own Commissary General and as an individual organization it rendered excellent service. It gave its officers and men training in its particular line of work and developed a high degree of proficiency. In 1912 it was absorbed by the Quartermaster Corps (together with other staff departments), the principal argument for such absorption being that the Quartermaster Corps could by adding one column to its books, carry on the work of the Commissary Department along with its own. No sooner was the absorption of this Department completed than its dissolution was begun. Its educational work has been discontinued, its *esprit de corps* has disappeared. Practically all that remains today of the Commissary Department, is the crescent in red which appears upon cases containing subsistence supplies.

The possibility of the union with the remount organization into a new Corps seems to have been the subject of discussion in the A. E. F. It is understood this plan contemplates the withdrawal of the remount branch from the Quartermaster Corps, and by union with the Veterinary Corps under a brigadier general, form a new organization or Corps. It has been claimed that the work of the remount service and the work of the Veterinary Corps are so closely associated that they might well be united under a common head. Except for this union at the head, it is contemplated that each organization would function along its own particular lines.

Two points of objection to this plan present themselves.

It cannot be conceived that the Quartermaster Corps would allow the withdrawal of the remount division, and the removal of its work from the Quartermaster Corps as it exists at the present time. Quartermasters and public animals have been associated since the beginning of military history, and the present policy of the Quartermaster Corps is to extend its field of operation rather than to contract it, and it is not believed that it would look with favor upon the withdrawal of the remount service.

Although the remount service and a certain branch of the work of the Veterinary Corps are closely associated, the same is not true of all of the veterinary service as regards the animals of the army nor of that other and important branch of the veterinary service, the meat and dairy inspection. Just how this branch of the veterinary service is to be coördinated with the remount work is not clear.

The veterinary service is quite essential to the successful functioning of the remount service but the reverse is not true and a veterinary service is maintained at many points quite independently of the remount service. One unacquainted with military methods might, with excellent logic on his side, argue that rather than allow the Veterinary Corps to be made a means of enlarging the powers of the remount service, the Veterinary Corps might well be extended by assigning to it and to its officers the purchasing powers at present reposed in the Remount Service. It is, of course, unnecessary to point out that the Veterinary Corps must from the nature of things function as a professional staff corps and not as a purchasing or procurement branch.

It might appear to the causal observer that the Veterinary Corps would render the best service to the Government by being affiliated with the Quartermaster Corps, for the reason that its work lies along the same general lines. All animals purchased for the military forces are purchased by the Quartermaster Corps, but pass the joint inspection of quartermaster and veterinary officers. Public animals, while in charge of quartermaster officers, are supervised and treated by veterinary officers with a view to preventing inefficiency and relieving disability. All purchases of meat for food products for the military forces are made by quartermaster officers, but their inspection is placed under the control and supervision of the veterinary officers. Forage and grain for the public animals, purchased by the Quartermaster Corps is, or should be, inspected by veterinary officers. This similarity of duties, has warranted the conclusion that these two Corps might well be amalgamated.

There are, however, these general reasons why such a procedure would not work to the best advantage, either of the Veterinary Corps or the military service. The inspection of animals and of meat and dairy products and of forage, should be conducted as separate and distinct from the purchase of these articles. In other words, the purchasing office should not be concerned in the determination of the quality of the supplies or animals offered. The inspecting officers should not be interested in the price paid. The accepted and published specifications are to be the sole guide in the determination of acceptable supplies or animals.

Because of the absence of professional literature, laboratory equipment and educational institutions in the Quartermaster Corps, and the well known tendency of the layman to belittle professional training, the tendency of the Corps under such an affiliation would, it is thought, tend toward a lowering of standards, rather than a raising of them. If affiliated with the Quartermaster Corps, quartermaster officers would determine the qualifications of the veterinarians eligible for commissions. One needs but to glance over the history of the veterinary organization at the time of the Spanish-American War, to find examples of the haphazard method by which the veterinarians were chosen for military service: at that time a number of veterinarians employed by the Quartermaster Corps were unskilled, uneducated non-graduates.

If the reader has any doubts as to the correctness of this statement, let him consult with some of the older veterinary officers in the present Corps.

As viewed by the onlooker the Quartermaster Corps is a tremendously large and constantly changing organization. Beginning with the absorption of certain staff departments in 1912, it has during the past emergency undergone a series of transformations. Within itself there are smaller departments and branches. The Director of Finance and the Director of Traffic have been separated to a degree. The Motor Transport Corps has been an offshoot, in fact, the entire Corps may be compared to a huge maelstrom, in a continual ferment, and where the Veterinary Corps would end once it became a part of this mass, is difficult to conceive.

The principal objection to the present plan of having the Veterinary Corps under the Medical Department, may be found in the fact that the Veterinary Corps functions under the control of medical officers.

The answer to this objection is that at the present time we have not a sufficiently experienced personnel from which to draw our administrative officers and so long as the Veterinary Corps is a part of the Medical Department it must be administered by representatives of the Surgeon General. It is confidently believed however that as the veterinary officers become better qualified in administrative duties, they will be allowed a higher degree of authority and experience less and less official interference from medical officers.

Under either of the two plans outlined, however, the Veterinary Corps would operate under outside officers.

It seems then for us to choose in our own minds at least whether we will remain under the medical officers, or be placed under non-professionals.

In consideration of these two controls, it is suggested that you ask the men who had experience under both departments, whether they would prefer to work under the Quartermaster Corps, or under the Medical Department.

Remember that for more than twenty years, a large number of veterinarians in the army had been a part of the Quartermaster Corps. In that twenty years they have been granted the magnificent salary of \$100.00 per month and denied the privilege of wearing the army uniform, and the veterinarians in other branches of the military establishment have attained the lofty height of donning the army uniform, drawing the pay and allowances of second lieutenants, mounted, but denied the rank.

Preventive veterinary medicine is closely allied to preventive human medicine. The two sciences proceed along parallel lines and the results of the investigations of one are frequently of valuable assistance to the other.

The work of the veterinary officers in connection with meat and dairy inspection, is essentially sanitary. The sanitation of the army is a part of the work of the Medical Corps, and by extending the training of its members, they could take over the work at present as done by the Veterinary Corps. With the Veterinary Corps a part of the Medical Department, there will be no occasion for such an extension, but with the Veterinary Corps as a separate organization, it is not difficult to imagine conditions under which such an extension might be given serious consideration. The Veterinary Corps has had limited experience in organization and administrative work. This is through no fault of its members, but due to the lack of opportunity. To endeavor to administer its affairs with inexperienced men surely would result in disaster. Some experiences to illustrate this point might be cited from the history of the Corps during the past few years.

It was only through the untiring efforts of the Surgeon General that the rank of major was restored in the Veterinary Corps. That the leading and patriotic members of our profession, who gave up lucrative practices and comfortable homes,

some even their lives, to serve their country in her hour of need, were not compelled to serve as second lieutenants, was due to the vigorous insistence of the Surgeon General, who appreciated their need of greater rank.

In my work as general veterinary inspector during the war, I have been frequently in conference with officers of the Medical Corps regarding sanitary conditions in the camps. I have invariably received the heartiest cooperation from them as well as many valuable suggestions. In several instances I have had to solicit their aid in convincing the commanding officers that suggestions made by the veterinarians were practical and necessary to the health of the command and should be carried out. Without their assistance it would have been a very much harder, if not impossible task to have established and put in force regulations governing the thorough inspection of all meat, meat products and dairy products consumed in the various cantonments and army camps.

The Medical Corps has always stood for higher education and a strict adherence to professional ethics. Associated with them we have the benefit of their extensive libraries and laboratories, as well as their instructors. As a strong argument in favor of the Veterinary Corps remaining a part of the Medical Department, it is only necessary for the reader to compare the results accomplished by the Corps in the United States with what was accomplished across the water, where it seemed that chaos reigned, not through any fault of members of the Veterinary Corps, as they knew what should be done and tried to accomplish results, but were hampered in their efforts through being placed under the Quartermaster Corps and having a layman at their head, while in the United States, under the interested and scientific direction of the Surgeon General, they not only worked in perfect harmony but developed an organization which secured results.

An efficient corps has been built up in the past two years. The material to work with was excellent, but it was entirely unorganized and woefully ignorant regarding military system and discipline.

In presenting these views to the veterinary profession, I have only one thought in mind, namely: that in considering this very important matter, important not only to the Veterinary Corps but to the profession as a whole, we may decide upon a

plan which will meet with the approval of the majority of the members of the profession. No plan is acceptable which has not for its basic aim, the building up of a Veterinary Corps composed of scientific veterinarians of the highest professional and personal qualifications—a corps second to no other and in every way a credit to its members, to the army and to the profession. We shall never be unanimous in details, but we should be united upon a general plan for the future. It is hoped that present grievances or prejudices will not be allowed to influence our decisions. Apparently the future of the Veterinary Corps promises much if we remain with the Medical Department. We shall share in the fruition of its plans. The Army Medical School will be open to veterinary officers. Its laboratories contain the veterinary section. Its training camps make provisions for its officers and enlisted men.

With the officers and men of its three Corps mingling thus intimately, in class rooms, laboratories, libraries, and camps, much will be done for the veterinary profession, in a professional, educational and social way. I believe in this direction our hope for the future lies.

Much has been accomplished under the Medical Department in the last two years. Shall we reject all that we have accomplished, and start out on a new and untried venture? I sincerely hope not. I feel sure that any member of the profession giving this matter mature consideration will concur in my opinion that the Veterinary Corps will attain the best results, both for the Government and for themselves, to continue as at present in close affiliation with the Medical Corps. I will venture to predict that after the continuation of the present affiliation for a few years, the results will be so excellent and so acceptable to the veterinary profession as to have completely and for all time obliterated future attempts to bring about a change.

CONTAGIOUS ABORTION DISEASE.*

By G. A. DICK, Philadelphia, Pa.

Since January, 1916, the Pennsylvania State Livestock Sanitary Board has been conducting experiments in the manipulation of the ovaries in cattle to correct disorders of those organs and

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to determine the value of Abrechtsen's method of douching the uterus for the control of contagious abortion disease, and correction of abnormal conditions of the reproductive organs of the cow causing sterility. Inasmuch as the value of said treatment in aberration of reproductive function has been reported, it is the purpose of this paper to bring to your attention the results obtained in the control of this disease. This report is on three herds, A, B and C.

HERD A.

New animals were added to this herd at various times during the past three years because a sufficient number of calves were not raised to keep the herd up to the required number; by this practice new centers of infection may repeatedly have been introduced.

The aborters, also those showing a discharge, and a few that calved normally were treated by administering the uterine douche containing Lugol's solution. Shortly after birth all calves were removed to an adjacent farm where they were kept away from infected cows, and fed raw milk from the main herd. Later, however, they were bred to the herd bull and pastured in a community pasture, coming in contact with other cattle which were possibly infected with abortion disease, and this may account for the disastrous results which followed as shown below:

Year	Abortions	Normal Parturitions	Percentage Abortions
1916	3	51	5.5
1917	5	106	4.5
{ 1918	28	95	22.7
{ Mature cows	6	67	8.2
{ Heifers	22	28	44.0

Heifer calves had never been raised on this farm until the beginning of this experiment; 1918 shows the results from first lot of heifers.

HERD B.

Care, management and treatment was similar to herd A with this difference, that new cows were added but once (1917) in the three years, and the calves instead of being pastured in a community pasture were kept in a separate lot on the same farm but the segregation was not absolute. The following is a summary of the results:

Year	Abortion	Normal Parturitions	* Percentage Abortions
1916	11	37	22.9
1917	17	30	36.1
{ 1918	4	43	8.5
{ Mature cows	2	33	5.7
{ Heifers	2	10	16.6

HERD C.

No new cattle added, as a sufficient number of young stock were raised. The cows about to calve were removed to a barn constructed for that purpose, while the aborters were isolated on another farm until the end of a normal period of pregnancy. The sheath of the bull after each service, the external genitals, thighs, and tails of the cows, also the floors and walks of the stable, were daily washed with an antiseptic solution. The calves were stabled near the main dairy barn and fed raw milk from the herd until they were four to six months of age. At the expiration of this time they were removed to another farm where they were kept until ready to breed. Then they were returned to the main barn, bred to the herd bulls and kept there during their period of pregnancy. The above system of management was in effect up to 1916 but in spite of all these precautions the disease was not checked.

Since March, 1916, all aborters and those calving normally have received the uterine douche, the aborters being returned to the main herd as soon as the reproductive organs were in a healthy condition. The calves instead of being returned to main herd to be bred—as was the practice prior to this time—were kept on a separate farm until within two weeks of calving time; thus a system of complete segregation was practiced.

The following is a summary of the results of this system of management:

Year	Abortions	Normal Parturitions	Percentage Abortions
1906	2	17	10.5
1907	7	31	18.9
1908	9	50	15.2
1909	19	37	33.9
1910	6	67	8.2
1911	15	72	17.2
1912	7	62	10.1
1913	12	91	11.6
1914	18	66	21.4
1915	14	87	13.8
1916	10	87	10.3
1917	6	78	7.1
1918	3	79	3.6

RECORD OF HEIFERS IN HERD C. UNDER PRESENT SYSTEM OF MANAGEMENT.

Year	Abortions	Parturitions	Abortions
{ 1916	1	18	
{ 1917	None	23	
{ 1918	None	23	

Prior to 1916 a large percentage of the heifers aborted each year.

The above figures indicate that raw milk from an infected herd has no deleterious effect, as far as contagious abortion is concerned, when fed to calves, and that the most effective means of preventing abortion is early separation and isolation.

Some of the cows that received the uterine douche aborted, indicating that the uterine douche is either not a specific treatment for this disease or that the methods of administering same must be improved.

SPECIAL REPORT ON THE HISTO-PATHOLOGY OF GLANDERS.

By CAPTAIN HADLEIGH MARSH, V. C.

In the work of the Department Laboratory at Fort Sam Houston on the laboratory diagnosis of glanders, it has been found that in some cases positive glanders lesions have been reported by field veterinarians upon post mortem examinations of horses which have been negative to the serological test. While these discrepancies may in some cases be explained by the fact that cases showing old healed lesions may properly be negative to serological tests, there is another factor to be considered, which is the correct interpretation of post mortem findings. That is, the question arises whether lesions reported as glanders nodules may not in some cases be caused by something else.

An attempt has been made to check by laboratory examination as many post mortem findings as possible. Since all the animal inoculations from glanders specimens received at this laboratory have been negative, the importance of establishing a diagnosis by microscopical examination of the tissue has been realized. In this connection it was found that the descriptions of the histology of glanders lesions in the literature available at this station were indefinite and somewhat contradictory. Therefore it is thought that a report on the findings in the tissues that have been submitted to this laboratory might be of value. It is regretted that this work was not taken up a year ago when a large number of specimens could have been obtained and preserved for histological study. None of this work was done during 1918, and during the first six months of 1919, only twenty-six tissue specimens have been received at this laboratory for examination for glanders. Of these only fifteen were suitable

for sectioning, and only a few were received in condition permitting of perfect fixation and imbedding. Of the fifteen specimens, taken from twelve horses and mules, which were sectioned, nine were negative as far as microscopic examination is concerned.

The six tissues which showed in the sections lesions which were considered to be caused by glanders were taken from five animals, all of which had given positive reactions to the intradermic mallein test. Guinea pigs were inoculated, with negative results in every case. The tissues were fixed in formalin and imbedded in paraffine, and the sections were stained with eosin and hematoxylin. In three of the cases the sections were also stained for bacteria by Loeffler's method, but no organisms were found in any case.

In connection with this series of tissues, glanders nodules in three guinea pigs inoculated with pure cultures of the glanders bacillus were studied and compared with those found in horses. It should be noted that the condition in the horses was chronic, while the guinea pigs developed acute glanders and were killed in three to five days after inoculation. However, in the absence of material from horses having experimental glanders, the known glanders lesions in the guinea pigs were of some value for comparison.

The following is a detailed description of the sections of each of the six positive specimens:

SPECIMEN No. 11.

This specimen was a nodule from the lung of a horse which was destroyed for glanders on a positive intradermic mallein test. This nodule showed no calcification, and was apparently active.

Guinea pig inoculations were negative.

The lung tissue is replaced by a fibrous connective tissue nodule, the section showing seven foci of inflammation imbedded in the connective tissue. Each focus consists of a central necrotic mass, sharply circumscribed, approximately circular in shape, and taking the eosin stain very deeply. At the center of the necrotic area is a small circular opening, containing a little amorphous material.

Immediately surrounding this necrotic area is a thin connective tissue capsule. Outside this there is a wider zone containing a few connective tissue cells, with lymphoid cells, large mononuclears, some polymorphonuclear neutrophiles, and a few

eosinophiles. Beyond this zone is the main body of the lesion, consisting of connective tissue, infiltrated with lymphoid cells, epithelioid cells, a few polymorphonuclear neutrophiles, and a very large number of eosinophiles.

In some of the nodules, between the necrotic mass and the connective tissue capsule, there is at one side a narrow area consisting chiefly of polymorphonuclear neutrophiles.

The walls of the blood vessels are much thickened.

No bacteria were found in sections stained with Loeffler's methylene blue.

SPECIMEN No. 24.

This tissue was from a mediastinal lymph gland from a horse destroyed for glanders on a positive intradermic mallein reaction. The tissue was received packed in borax, and was not in good condition to fix for imbedding.

Guinea pig inoculations were negative.

The sections of the lymph gland showed an area containing several small nodules which had become partially calcified. Surrounding the calcified centers there were fibrous connective tissue nodules, with a small amount of active tissue containing a large number of eosinophiles.

There was a small amount of lung tissue attached to the gland, sections of which showed bronchitis and thickening of the alveolar walls. The bronchi showed a desquamation of epithelium, the lumen being nearly filled with epithelial cells. Immediately surrounding the bronchus is a fibrinous exudate, with some connective tissue cells, and an infiltration of lymphoid and epithelioid cells, and many eosinophiles. The walls of the alveoli all through the section are thickened by a similar exudate. The walls of the blood-vessels are hypertrophied.

No bacteria were found in section stained with Loeffler's methylene blue.

SPECIMEN No. 25.

This specimen was from the liver of the same horse from which No. 24 was taken.

The sections showed two nodules just beneath the capsule. Each nodule contained a central necrotic mass which was partially calcified. Surrounding this central mass was a connective neutrophiles, epithelioid cells, many large mononuclear cells and a great many eosinophiles. Outside this zone is another

tissue capsule. Outside this capsule is an incomplete zone consisting of connective tissue infiltrated with polymorphonuclear composed chiefly of connective tissue, beyond which are the liver cells.

Scattered through the liver near the nodules, are small areas of connective tissue reaction around the small bile ducts and polymorphonuclear eosinophiles are frequently found among the liver cells. The liver cells show cloudy swelling.

SPECIMEN No. 26.

This was from the spleen of a mule destroyed for glanders on a positive intradermic mallein reaction. This material was received packed in borax, and in poor condition for sectioning. It was hardened in formalin and the sections stained with hematoxylin and eosin.

Guinea pig inoculations were negative for glanders.

The sections showed that the spleen capsule and the trabeculae were very greatly thickened. There was one nodule just beneath the capsule, consisting of a necrotic, partially calcified center, surrounded by dense connective tissue. The spleen pulp next to the nodule was congested and contained a large number of eosinophiles.

SPECIMEN No. 27.

This was from the intestinal wall of a horse destroyed for glanders on a positive intradermic mallein test. The specimen was received packed in borax, and was in poor condition for fixing and imbedding.

Guinea pig inoculations were negative for glanders.

The sections showed a nodule in the outer muscular coat, consisting of a central necrotic mass, partially calcified, surrounded by a connective tissue formation, infiltrated with a large number of eosinophiles. Throughout the mucosa, submucosa, and outer muscular coat, there is a very great number of eosinophiles, and also an increase in connective tissue cells.

SPECIMEN No. 28.

This specimen was a group of mediastinal glands from a horse destroyed for glanders on a positive intradermic mallein test. The glands themselves did not show any lesions, but in the fatty tissue adjacent to them was a fibrous nodule containing several small foci and two very small points of cal-

cification. This tissue was received packed in borax and in excellent condition so that it was possible to imbed and section it perfectly.

A portion of the normal appearing gland tissue was inoculated into a guinea pig with negative results.

The sections show that the lesion consists of a fibrous tissue nodule about twelve mm. long by six mm. wide, of an irregular shape, with strands of connective tissue running out into the surrounding fat. The nodule contained a number of small foci or nodules of irregular shape, tending to be circular, imbedded in a connective tissue matrix. This matrix consists of fibrous connective tissue with epithelioid cells, some lymphoid cells, and a very large number of eosinophiles.

The older nodules consist of a sharply defined central mass, more or less circular in shape, taking the eosin stain very deeply. Degeneration of the cells has taken place, leaving the nuclei intact, and all of the nuclear material staining with hematoxylin. Most of the nuclei appear to be from lymphoid cells and polymorphonuclear leucocytes. There are a few intact eosinophiles. At the center of the nodule is a small circular opening, containing some amorphous material.

Immediately surrounding the central mass is a narrow zone consisting chiefly of connective tissue and epithelioid cells. Outside this is a wider zone in which lymphoid cells predominate, with many epithelioid cells, large mononuclear cells and eosinophiles. Outside this zone is the main body of the lesion, where eosinophiles predominate, in a connective tissue matrix.

There are some small foci in this connective tissue formation in which connective tissue cells are absent, and there are only a few eosinophiles. The foci consist of lymphoid cells chiefly, with a few large mononuclear and epithelioid cells.

In some of the smaller foci, it appears that the eosin staining mass at the center consists of the freed granules of eosinophiles, with nuclei still staining but free from the cytoplasm.

The walls of the blood vessels in the nodule are greatly thickened.

Sections stained with Loeffler's methylene blue and Goodpasture's stain failed to show any bacteria.

Sections were made of the omentum of guinea pig 265 and of the testicles of guinea pigs 246 and 258. Nodules of the same character were found in all sections but the most marked reaction

occurred in the omentum of guinea pig 265. A detailed description of the lesions in the omentum follows:

The sections show numerous small nodules, some distinct and some confluent. In general, they assume a circular shape, but the reaction extends out into the loose tissue in irregular areas. The center of each nodule consists of an accumulation of lymphocytes, polymorphonuclear neutrophiles, some eosinophiles, and a large amount of free chromatin granules and broken down cells. Around the periphery of the nodule are epithelioid cells infiltrated into the connective tissue framework of the omentum. At the edge of the nodule the connective tissue cells are compressed, forming a marked limiting zone.

The larger nodules show in some portions a great number of eosinophiles, especially along the border of the nodule.

In some of the nodules is found the peculiar type of giant cell described by Mallory as characteristic of glanders. This consists of a large lobulated cell body containing several nuclei. In these sections the appearance was that of several mononuclear cells being fused.

In these sections the lymph channels are greatly distended, and the glanders nodules apparently develop along the course of these channels. The blood vessels of the region are injected.

Loeffler's methylene blue stain shows the glanders bacillus in great numbers throughout the nodule, but not in the surrounding tissue.

All six specimens show the same pathological condition in general, with slight variations due to differences in the tissue involved and the age of the lesion. The general nature of the lesion is that of a chronic inflammatory reaction to infection. The lesions usually consist of several foci of inflammation imbedded in a fibrous connective tissue nodule of irregular shape. Each focus has at its center a sharply circumscribed necrotic mass, approximately circular in shape. This is surrounded by a connective tissue formation infiltrated with eosinophiles. In most of the sections there is just outside the necrotic area a zone consisting mainly of lymphocytes, polymorphonuclear neutrophiles, epithelioid cells and large mononuclear cells. In part of the nodules the central necrotic mass is partially calcified.

In comparing the type of lesion found in the horses with those described in the guinea pigs, we find sufficient resemblance

to warrant the assumption that the one is the chronic condition due to the same infective agent as the acute condition in the other. In the guinea pig nodules there is no sharply defined necrotic center, but the cells at the center of the nodule are degenerating, and the necrotic center would probably develop if the disease became chronic. The formation of connective tissue so prominent in the chronic lesions is also absent in the nodules from the guinea pigs. Except for the absence of new connective tissue in the acute lesions, the types of cells forming the nodules and the form and distribution of the nodules, are very similar in both cases.

A very striking characteristic of all the tissues from the horses was the very great accumulation of eosinophiles. As this was a condition which is not described as occurring in glanders, and as Hutyra and Marek mention the presence of large numbers of eosinophiles as diagnostic of parasitic nodules, quoting Schütz as saying that eosinophile cells absolutely do not occur in glanders nodules, it was thought that some of the lesions being reported as glanders were really parasitic. This view was given support by the fact that all our guinea pig inoculations were negative and we were unable to find bacteria in the sections. But study of the acute lesions in the guinea pigs showed that known glanders nodules contain large numbers of eosinophiles. This was not found to be true in the smallest nodules, but in the larger ones eosinophiles were present in very large numbers indicating that the number increases as the lesion gets older.

As a result of this study, it appears that in the six specimens studied the pathological lesions were all of the same type, and showed characteristics which were distinct from those of any other condition. It has been assumed that the glanders bacillus is the cause of this lesion, as the animals all reacted positively to the intradermic mallein test, and the guinea pig nodules corresponded to those in the horses as closely as an acute condition could correspond to a chronic state.

If our conclusion is correct that the nodules described above are glanders lesions, it should be possible to confirm a post mortem diagnosis by microscopical examination, providing that calcification of the nodule has not become complete.

REFERENCES.

Hutyra and Marek: Pathology and Therapeutics of the Diseases of Domestic Animals, 1912. Vol. 1, pp. 691, 726-727.

Moore: Pathology and Differential Diagnosis of Infectious Diseases of Animals. 1908, pp. 155-163.

MacCallum: Text-book of Pathology, 1916, pp. 552-554.

Coplin: Manual of Pathology, 5th Edition, 1913, pp. 139-140, 634.

Mallory: The Principles of Pathologic Histology, 1914, pp. 158-161, 460.

Delafield and Prudden: Text-book of Pathology, 9th Edition, 1911, pp. 226-227.

VETERINARIANS SHOULD ADVOCATE HUMANE METHODS.

By W. G. HOLLINGWORTH, Utica, N. W.

Shakespeare says "The humane way is the best." Tenderhearted, kindhearted, compassionate, sympathetic, humane, should be the war cry of every veterinarian. They all express active endeavors to find out and relieve suffering and especially to prevent it. He should stand as an index or representative, a leader of a party who advocates such a procedure.

The veterinarian depends upon the dumb animals for a livelihood to a very great extent. The necessity of their care and protection to him is of the most vital importance. To him the community is now looking for such action, as they too depend on the livestock interest to a very large extent for food and clothing and on such interests depend much of the prosperity of this nation, as agriculture is the foundation of such, and without livestock agriculture would be at a low ebb. It behooves us as guardians of health of such interests to act in such a capacity to build a suitable structure upon the foundation laid for us at the school from which we received our degree. If we do not comply with the teachings laid down, although not in a course of lectures, but alluded to at different times, by the many lecturers, calling attention to the practicing of humane methods, it is no fault of the college. The faculty did their duty, it is for us to make good. Today the veterinarian is looked upon as a person of intellectual ability, a promoter of methods that will increase his standing in the estimation of the community within his jurisdiction. He today is an authority, his opinions are sought, his decisions bear weight, much differ-

ent than former days, when they were looked upon with disrespect, a man who had no feeling for our dumb friends, a heartless wretch. But mind you, I am not saying that all veterinarians are inhumane, but believe me there are many of them. There can be no work more elementally benevolent than that which seeks to help those who cannot help themselves, nor recompense you for the aid you gave them. When a human being looks at the suffering of the inferior animals and with a heart full of love seeks to alleviate those sufferings, he is patterning after a true conception of boundless munificence and love and philanthropy of the good and great creator of all. Such a man or woman cannot be otherwise than kind to all, for if sympathy is deep enough to reach the lower animals, surely it will include the higher or human as the greater sentiment includes the lesser, and what an exalted place our profession would attain to if such benevolence and sympathy could be made common among us all, and who dare say such a condition of things is unrealizable when we look at the progress of the humanitarian views in the last few years. Deeply imbedded in man's nature, stultified and covered up oftentimes by lack of forethought, lie unexplored sources of good which may yet be developed into incalculable blessings to man in the care and love to animals. All that is needed is to sow the seeds of humanitarianism on the deep fruitful soil and not on the surface. To get rid of cruelty, whether expressed toward a child or animal, which is an indulgence in the lower impulses that remain as a reminder of barbaric times, the cruel veterinarian does more than inflict unnecessary pain on his subject, he injures himself. The impulse that leads him to cause uncalled for suffering to the dumb beast, is the same that raises his hand brutally against his own offspring.

The progressive veterinarian of today is fast adopting anesthesia, both general and local in his daily practice. Prof. Wooldridge said, in a broad sense the term means a suspension of sensation whether due to disease or injury. The chief use of anesthesia is the abolition of pain during operations and the prevention of various reflexes and muscular relaxation. We are using anesthesia not only to operate but to make a more perfect diagnosis. Our clients are asking and some demand such. Their investment demands the most efficient procedure. The

idea of a client objecting to the small extra expense is fast fading away and it is a poor excuse for the veterinarian to fall back on. They are fast advocating the abolition of pain as the advantages of general and local anesthesia are becoming so plain to the owner and operator. The time is not far distant when it will be compulsory and I will be one of those who advocate it, that no operation involving pain should be performed without the assistance of an anesthetic or an analgesic. A great many of us should study respiratory anesthesia more generally and become more proficient in its use. I am of the opinion that many of us are too timid for fear of unpleasant results. That can be overcome by experience. I do not think that a veterinarian should depend upon an inexperienced assistant, rather do it himself. I have always done my own anesthetic work, it takes time I admit and some expense, but the pleasure is yours. Patient, quiet, insensible to pain, client well satisfied and a legitimate way of bringing your name before the public as a humanitarian, which is the public sentiment now days. To me the veterinarian who practices surgery without alleviating pain to a minimum, is not doing his duty to himself, family, community, college from which he graduated, client nor patient, and to my way of thinking he ought to be the subject of censure. There is no reason under the sun why we should torture our dumb animals, because we can put them in such positions under restraint. They are very sensitive to pain. While it is under our power to relieve them, why should some persist to so act. How often we read articles in our veterinary journals written by men high in our profession, advocating operating under methods without relieving pain or torture first. This is very painful to me and others who believe as Shakespeare did that "The humane way is the best". There is just as much humanity in caring for the sick animals as those who are subject to operation to see to it that our patient receives the proper care and sanitary conditions, and here is where the veterinarian ought to be an educator, to instruct the caretakers to act in as humane a manner as possible so as to give the poor dumb creature such care as is necessary for his or her comfort, whether the result is convalescence or death. One of the greatest acts of humanity that can be performed on our dumb friends is in their destruction at the proper time. To this the veterinarian

must be judged. Here his opinion is asked very frequently, and here is where he must be a student of conditions. His sense of observation must be very keen. Would it not be better to destroy at once rather than to have his patient bear the pain of suffering if an invaluable animal is the outcome? Here again the veterinarian should educate himself to be governed by his first impression which if this motive has been his constant study and thought during his professional career, it will be the most lasting and to a very large extent the most correct. Now how is this to be done the most humane way whatever that may be and that may differ under different conditions. Alleviate the pain and suffering as soon as possible with the least pain and excitement and here is where you will get the good will of the sympathetic owner and looker-on. Now in regard to the sympathetic person. Sometimes they go to extremes, overdo it so to speak, can only see humanity from one side, in fact some do not want to take the other side into consideration. To my way of thinking, to cause slight pain or inconvenience is far less harmful and more humane than to let conditions go on unattended to whereby results may occur which may cause the worst kind of agony and death to untold numbers, whether it be to the human or brute family. Now I believe the true humanitarian ought to be broad minded enough to take all things into consideration and look at humanity in the sense of prevention, and that is the age we are living in now. Prevention is better than cure. There is a vast difference today in regard to the methods of experimental medicine as compared with that practiced years ago and that is due to the teachings of the practice of humanity where ever possible. No one now a days is going to practice animal experimentation just from choice, but unfortunately there is no alternative. I am at the head of a humane society in my city and surrounding towns and believe I have as true humane feelings as one can have, in fact it is natural, being placed in the position that I am through my profession, and see the things I do and know the consequences, which would have occurred through lack of knowledge, and still there is more to learn and will continue as long as our great aim is prevention. It makes me feel that the sufferings of a few is more humane than to allow scourges to sweep the land, carrying sickness and suffering of incalculable numbers and a great many deaths.

Is it more inhumane to subject a few of the animals as I have mentioned for scientific purposes under as humane conditions as possible, than trap fur-bearing animals for their furs, shoot feathered birds for their plumage? To me it is not necessary to go into detail regarding the sufferings these animals have to endure. I personally have noticed some of these people who are so bitter against animal experimentation to adorn themselves with furs, feathers and birds, and think nothing of it.

I think if the American Veterinary Medical Association would take some action in regard to the practicing of humane methods among our patients, and let the public know it, it would be received with open arms by all persons interested in the welfare of animals, and one of the greatest assets our profession could receive.

THE PRESENT STATUS OF HOG CHOLERA CONTROL.

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At no time in the history of veterinary science in this country has the subject of diseases of swine been of more importance and greater interest than at present. One only need to look over the programs of the meetings of the various veterinary medical associations in the country and become readily impressed that the subject of controlling infections in hogs is given a great deal of attention and furthermore that there appears to be a greater confusion in our knowledge on such infections than at any time in the past few years.

The statement of Dorset that aside from hog cholera, other infectious diseases of swine in this country are negligible, has been refuted by some observers who claim that in certain localities losses from other infections surpass those sustained from hog cholera. Unfortunately up to date such statements have not sufficient conclusive scientific backing and we are still in the dark with regard to the significance of other diseases than hog cholera as being responsible for great losses among hogs.

The publications from the Bureau of Animal Industry in the past two years have shown conclusively that losses from hog cholera have been materially reduced through the use of Anti-Hog Cholera Serum and Virus, these statements being backed up by

conclusive statistical data. On the other hand the frequent reports of continuous losses in herds which have been vaccinated against hog cholera and also among hogs which have not been vaccinated, from infections of hemorrhagic septicemia and necrotic enteritis are indeed alarming.

The writer has attempted to obtain data to what extent these so-called mixed infections occur independently of cholera and followed up cases in which a primary diagnosis of either hemorrhagic septicemia or necrotic enteritis has been made on post-mortem and bacteriological findings, to note whether such diagnosis was justified. In about two-thirds of these cases, however, a subsequent diagnosis of hog cholera had to be made from post-mortems on animals which died in the progress of the outbreak.

There is no doubt but what we have at the present time a different condition in infections in hogs than at the time of the earlier hog cholera investigations. That is, we are confronted more frequently with complications or independent outbreaks with pathogenic organisms which were heretofore justly considered only as secondary invaders in association with virus cholera.

The question arises what has brought this change about. Various factors might be considered as being responsible for the apparent increased pathogenicity of some of the infectious agents. From our knowledge of pathogenic organisms, especially of those known to be facultative pathogenic, we know that by continuous animal passage they may increase their virulence to a very marked degree. This no doubt has been the case with some of the organisms now being met with in the various swine infections which condition might have been brought about by natural sequence such as occur in the ordinary course of epizootics as for instance in foot and mouth disease, hemorrhage, septicemia, influenza, etc. That is at the beginning of the outbreaks the disease is less virulent in type and gradually gains in intensity until the height of the curve is reached from which a gradual diminishing of virulence is observed. By passage through animals the so-called mixed infections in diseases of hogs might gain such an increased virulence and consequently they have now become by far more pathogenic than they have been in the past.

Another factor and to my mind a more important one whereby these so-called mixed infections are occurring now more frequently is due to the spread of the infection by so-called virus carriers. Virus carriers which are apparently healthy individuals are now being recognized to be the greatest menace to the sanitary police authorities and are probably responsible to a greater extent for spreading disease than any other cause. Thus in infectious diseases of man we are especially confronted with these sorts of spreaders. I only desire to mention typhoid fever, diphtheria, spinal meningitis and others in all of which the menace from virus carriers is greater than from the patient sick with the respective diseases.

Virus carriers in animals are also now being recognized as big factors in spreading contagions. Thus from all appearances normal animals may harbor the infection and at favorable opportunities communicate it to susceptible animals. Influenza, dourine, foot and mouth disease have been proven to be sometimes disseminated by such virus carriers.

In mixed infections of swine we have principally three groups or organisms which are especially responsible for infections and the characteristics of all these organisms more than suggests the probability that they may be present in individuals of so-called virus carriers and at favorable opportunities become factors in the dissemination of these infections.

Bacteriological studies of the bacterial flora of the respiratory and digestive tracts of hogs have shown that the hemorrhagic septicemia organisms, the *B. cholera suis* and the *B. paratyphosus* are present in apparently healthy hogs. Furthermore those who have had the opportunity to conduct many post-mortem examinations on apparently healthy hogs have very frequently noted small areas in the lungs undergoing hepatization which in many instances appear to be chronic in character. These consolidated areas on bacteriological examination frequently reveal the hemorrhagic septicemia organisms and since they occur in apparently healthy hogs they may be readily expelled through the passages and cause infections.

On the other hand the *B. cholera suis* and the *B. paratyphosus* are types of organisms which are known to remain in their pathogenic state in apparently healthy individuals. Investigations along this line have established this fact in human

beings and to a lesser extent in animals. The very frequent erosions and slight ulcerations around the ileocecal valve which are met on postmortem examination in apparently normal hogs have disclosed a remarkable variety of pathogenic and nonpathogenic organisms and no doubt these organisms being evacuated with the intestinal contents may under favorable conditions produce the characteristic lesions of these infections. The name of "mixed infection of hogs" is of course inappropriate, and I simply use the term at the present time as the veterinarians have become used to designating this condition under that name.

Finally one must not lose sight of the possibility that in the effort of controlling hog cholera by the extensive use of vaccination has probably resulted in increased resistance in our present hogs and that as a result of this the disease caused by the filterable virus becomes somewhat obscured and the secondary infections which have always been recognized in connection with hog cholera appear to be predominating. As a result our attention becomes distracted from the true etiological factor and in the absence of the typical cholera lesions the veterinarian is apt to make a diagnosis of either hemorrhagic septicemia or necrotic enteritis whereas actually the true original factor was the filterable virus.

The evidence may be summarized:

1. That we are not confronted at the present time with new diseases in swine.
2. That the infections aside from cholera represent pathological processes caused by organisms recognized before as being pathogenic to swine.
3. That due to some favorable conditions they have developed an increased virulence.
4. That due to the tremendous traffic in swine so-called carriers have contributed to the dissemination of these infections.
5. Finally that we must still recognize the filterable virus as being the most important factor as preparing the field for the other pathogenic organisms.

I have abstained from mentioning the so-called necrobacillosis since the introduction of this name has never been justified as there never was sufficient scientific data presented by which the *B. necrophorus* could have been incriminated as being the primary responsible factor for the intestinal necrotic infections

of hogs. On the other hand artificial infections with *B. cholerae suis* and *B. paratyphosus* have successfully produced lesions commonly met with in intestinal infections of hogs. Thus the presence of the *B. necrophorus* at the best can be accorded only of secondary importance in such lesions.

It is not the intention to discuss the infections caused by germs pathogenic to hogs but it might be advisable to emphasize the fact that the lesions produced by them are occurring now with greater frequency and that their significance should not be underestimated. The control of these infections, however, is essentially a control of hog cholera and an effective and successful control of hog cholera would result in a very pronounced diminishing of the other infections.

Hog cholera control has been exhaustively treated in bulletins and scientific articles appearing in our journals. The disease and its prevention is familiar to most every one interested in the treatment of swine diseases; yet on account of the variations of the symptoms and lesions disclosed by the animal affected with the disease even the most experienced veterinarian is at times at a loss to make a definite diagnosis either from observation of symptoms of a single or several postmortem examinations. This is no doubt due to the fact that the disease manifests itself in many different forms. In some instances it is peracute; other times subacute, and may even develop into a chronic form. The symptoms and lesions vary accordingly and become more or less obscure, and due to this fact the uncertainty of a definite diagnosis by the veterinarian is so common.

In the majority of cases, however, the observation of sick animals together with postmortem examination should enable the veterinarian to make a diagnosis. All evidence of the symptoms and lesions should be carefully weighed and if possible the diagnosis should not be delayed. Temperatures should be taken of all animals which very frequently aids materially in the diagnosis. The absence of pathogenic lesions of hog cholera should not necessarily be accepted as conclusive and in such instances the condition of the balance of the herd should be given careful consideration.

In case of any doubt whether the animals are affected with cholera or some other infection the owner should be advised that delay in waiting for definite signs might prove costly and the

veterinarians should suggest the treatment of the herd for cholera.

A differential diagnosis in favor of hemorrhagic septicemia or other forms of mixed infections should not be made unless sufficient evidence is present to justify the same. That is, in case hog cholera can be excluded by the fact that the animals have been properly vaccinated with potent serum or virus; or if the symptoms of hemorrhagic septicemia or intestinal infections are found to exist in several hogs without any indication of a hog cholera infection.

It is impossible to enter into detailed description of the differential diagnosis within the scope of this paper but this phase of the subject has been exhaustively treated in the up-to-date textbooks and also in special publications. However, emphasis is placed again upon the importance not to be misled by the absence of characteristic lesions of cholera and render a negative diagnosis.

Since the essential feature in the control of hog cholera is now recognized and accepted to consist of sanitary measures and prophylactic treatment of the animals with Anti Hog Cholera Serum and Virus, it will be advisable to discuss briefly the method of procedure in preparing the products used in this treatment and the method of administering the same. It has been definitely established that Hog Cholera Serum is one of the most reliable biological products at our disposal, but at the same time we cannot deny the regrettable fact that the development of the laboratory aspect of this product has been lagging far behind and that very little progress has been made in producing this product in an improved manner to justify its wonderful effectiveness in the control of this dreaded disease.

It should be considered that in the prevention and treatment of a disease of so vast importance to the country's live stock industry as hog cholera, the product used for its control should be beyond reproach especially so since the effectiveness of the treatment is being justly recognized.

It is undeniable that all establishments engaged in the production of Hog Cholera Serum are making all efforts to produce a potent product, but as it is produced today by most of the laboratories it represents only defibrinated blood from hyperimmunized hogs, a product in its very crudest stage of develop-

ment as far as the physical make up and its freedom from contaminating germs is concerned.

The production of a clear Hog Cholera Serum without the presence of corpuscular elements of the blood was practiced in different countries of Europe and also in isolated cases attempts were made in this country to produce such a product. The small yield obtained from such blood was of the greatest detriment to engage upon the production of such clear serum by the different manufacturers. Dorset recognizing this fact as a disadvantage for the development of a clear Hog Cholera Serum undertook investigations along this line which developed in a method whereby practically all serum can be recovered from the blood of hyperimmunized animals and it is to his credit that such clear serum may be produced at a cost not much higher than the ordinary defibrinated blood.

In the method of preparation of Anti Hog Cholera Serum as is generally practiced it is impossible to prevent contaminations from outside sources; aside from this there is the possibility that the hyperimmunized animals may contain in their blood organisms which might prove harmful to animals injected with the product.

Furthermore, so-called bloody Hog Cholera Serum contains all the corpuscular elements of the blood which have no value whatever in the production of immunity, this fact having been conclusively demonstrated. It must be also recognized that when the corpuscles are injected with the serum they prevent quick absorption and act as irritants at the point of injection, frequently giving rise to abscess formation. Thus such serum has not fulfilled the requirements of an ideal and effective biological product.

Serum containing corpuscular elements cannot be properly sterilized neither by heat nor filtration, since when heated to a point where the ordinary pathogenic germs are destroyed it coagulates; whereas its Berkefeld filtration is out of the question. On the other hand clear serum can be readily sterilized by either of the methods and by such sterilization the ordinary pathogenic germs which are dangerous to hogs are readily eliminated and by freeing it of corpuscles it is rendered more easily absorbed, thereby insuring the maximum protection within the shortest time. The fact should not be lost sight of that by

eliminating the corpuscular elements from the hog cholera serum it may be injected in proportionally smaller dosage.

In advocating a clear and sterilized serum for the control of hog cholera it is not in the least the intention to discredit the serum which has heretofore been prepared. However, from a scientific point of view and in consideration of the technical advantages which the administration of a clear serum possesses should induce the manufacturers to enter upon the preparation of such a serum, especially so since the cost of production is not materially increased and only requires more skillful handling and greater care in the manufacture.

Ever since the writer studied the production of Anti Hog Cholera Serum in Hungary in 1909 he recognized the advantages of a clear serum and has not failed to point out its superiority on every occasion. It is surprising that up to date manufacturers have not changed their crude method in preference to a more up to date and satisfactory procedure. May I not point out the fact that there is no country abroad where a serum containing corpuscular elements could be sold; all these countries requiring in their specifications a clear serum. Surely there must be a reason for this. It is the writer's firm belief that the veterinarians would readily advocate and accept such a product if it would be available.

With reference to the virus there should also be an effort made to prepare the same in a more refined form and free of any possible contamination. The advantages of such virus are also apparent. However, in view of the fact that the animals receive only about 1/25 of virus to the amount of serum the danger from this source is not comparable with that arising from a contaminated serum.

As the control of hog cholera constitutes at the present time a very important part in the activity of the veterinarians, and as the writer believes that the foundation of the control is vaccination with a proper serum and virus, the producers in order to assist the veterinarian in his effort should aim to supply the profession with the best that is possible to produce.

The striking advantages of a clear and sterilized serum are:

Freedom from contaminating organisms and other foreign materials, avoiding complications and ill effects.

Refinement of the product, permitting rapid and complete absorption and giving maximum immunity in the shortest time.

Provision for cleaner and more accurate technic thereby simplifying the vaccination.

Sterility, promoting keeping qualities of the product.

It should also be recognized that a great deal depends on the proper technic in vaccination as the efforts exercised in the production of the product may become nullified by careless technic. Sanitation which should be also given due consideration does not offer any new problem and should be carried out in accordance with the sanitary requirements of the authorities for the control of this or any other highly contagious infectious disease.

The veterinarian in his effort to control hog cholera should give due consideration to every factor including proper diagnosis and prophylaxis since only by so doing and employing the best means at his disposal for the control of the infection can he expect to serve his clients as he should.

STUDIES ON ANTHELMINTICS.

IV. EXPERIMENTS WITH COMBINATIONS OF OIL OF CHENOPODIUM AND CHLOROFORM.

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Whether a combination of oil of chenopodium and chloroform might be a valuable one, has been discussed by Hall and Foster. They state:

"Various writers have advocated the use of chloroform in castor oil in connection with oil of chenopodium or other anthelmintics, and some have claimed a synergistic action for chloroform and chenopodium. We have not found any convincing evidence of synergistic action. Chenopodium has a certain anthelmintic value for hookworms and chloroform has a greater value; but we have not observed that the simultaneous use of the two drugs adds to the efficiency of the chloroform alone. However, the combination of chenopodium and chloroform is a valuable one, as the chenopodium can be expected to remove

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ascarids, when they are present in hookworm cases, and ascarids are commonly present in such cases."

The experiments supporting the above comment on the combination of chenopodium and chloroform were later published by Hall and Foster as follows:

In one experiment, chenopodium was given in the dose of 0.1 mil per kilo, the single therapeutic dose, daily for a total of 6 doses. It was mixed with 10 times its volume of olive oil and preceded by castor oil in amount equal to the olive oil; 1 minim of chloroform per kilo body weight was added to the olive-oil-chenopodium mixture the first day and to the castor oil the following days. This treatment removed 8 out of 8 ascarids (100 per cent), and 94 out of 133 hookworms (71 per cent).

In a second experiment, 4 dogs were each given chenopodium and chloroform, each at the rate of 0.1 mil per kilo; the drugs were given in castor oil, from 12 to 40 mils, according to the weight of the dog. This treatment removed 7 out of 8 ascarids (87.5 per cent,) and only 7 out of 61 hookworms (11 per cent).

In a third experiment, the dose of each drug was doubled, being given at the rate of 0.2 mil per kilo, and in about 30 mils of castor oil. This treatment removed 100 per cent of the ascarids and over half of the hookworms.

Hall and Foster state that 0.1 mil per kilo of each of these drugs is too small a dose for the best results. It is the opinion of Hall, as stated elsewhere, that 0.1 mil per kilo is the proper dose of oil of chenopodium for use against ascarids, representing a dose which will seldom fall below 100 per cent efficacy, as smaller doses do too frequently, and which is naturally less toxic than larger doses. As for chloroform, the dose of this drug for dogs should certainly be at least 0.2 mil per kilo, and 0.3 mil per kilo is well tolerated.

The writer is now of the opinion that under suitable conditions of administration, a single dose of both drugs will secure better results than a single dose of either one alone.

The following experiments indicate that a single dose of 0.1 m. p. k. of chenopodium and 0.2 m. p. k. of chloroform gives very satisfactory results where the two drugs are both used in the same treatment and the chenopodium is given in the soft, or soluble elastic, capsule. In these

experiments, the dogs were given oil of chenopodium at approximately the rate of 0.1 m. p. k., so far as the dose could be approximated in the administration of soluble elastic 5- and 10-minim capsules, and were given chloroform at the rate of 0.2 m. p. k. in hard gelatine capsules, No. 00. The purgative, for which the kind and amount is specified, was given immediately after the other drugs. From what the writer has observed of the action of these drugs under these conditions, the chloroform would be very promptly released in the stomach; such purgatives as castor oil would rather promptly begin to pass out with their chloroform content, while such oils as olive oil would tend to remain in the stomach a rather long period; and the soluble elastic capsules, when given with castor oil, would digest or open in the stomach within a half hour or so. The castor oil in the stomach and its persistent purgative action in the intestine would carry along the chenopodium, whenever it left the stomach.

Dog No.	Wt.—Kilos.	Chen.—Mms.	Chlor.—m.p.k.	Purgative	Efficacy (%) Against				Digestive Tract
					Ascaris	Hook-worms	Whip-worms	Tape-worms	
23	11	15	0.2	Ol. ric. 30 mils.....	100	....	....	....	Normal
27	12	15	"	Ol. ric. 30 mils.....	75	0	100	....	Normal
28	17	25	"	Ol. ric. 30 mils.....	100	....	....	....	Normal
30	9	15	"	Ol. ric. 30 mils.....	100	....	....	....	Normal
31	6	10	"	Ol. olivae 60 mils. sod. sulph., 2dr.....	....	....	0	0	Gast.-ent. hem.
32	7	10	"	Ol. olivae 30 mils.....	100	....	....	....	Gast.-ent. hem.
33	8	10	"	Ol. olivae 30 mils. calomel 2gr.	100	57	....	0	Ent. hem.
34	9	10	"	Ol. olivae 30 mils. 2 C. C. pills	40	....	....	....	Ent. hem.
35	8.5	10	"	Ol. olivae 30 mils. Elaterin gr. 0.1.....	83	....	....	0	Normal
38	10	15	"	Ol. lini 60 mils.....	100	92	....	....	Ent. Infl.(mod.)
40	10	15	"	Ol. ric. 60 mils.....	100	100	....	....	Normal
41	10	15	"	Ol. ric. 60 mils.....	No conclusions. Sickly animal; died next day.				
60	7	10	"	Ol. ric. 20 mils. Ol. olivae 20 mils.....	....	....	0	0	Inflam.
64	9	15	†20	Ol. coco. 30 mils.....	100	....	0	....	Inflam.
67	8	15	"	Ol. ric. 60 mils. in S. E. cap- sules.....	100	....	100	0	Inflam.
70	9	15	"	Ol. ric. 20 mils. Ol. olivae 20 mils.....	....	....	0	0	Hem.

†Minims

There are 16 dogs in the foregoing table, of which one, No. 41, must be disregarded in drawing conclusions, as the animal, a clinical case of uncinariasis, died the day following treatment,

too early to permit of anthelmintic action. The other 15 dogs had a total of 150 ascarids, an average of 10 per dog; 40 hookworms, an average of 5.6 per dog. Of these worms, the combined chenopodium (0.1 m. p. k.) and chloroform (0.2 m. p. k.) treatment removed 146 ascarids (97 per cent), 35 hookworms (87.5 per cent), 4 whipworms (12.5 per cent), and 1 tapeworm (1 per cent). These percentages for efficacy against ascarids and hookworms are high. The showing against hookworms is especially high for single dose treatments and is better than the average obtained by single doses of either drug alone. It is better than the result obtained by Hall and Foster in giving both drugs at the rate of 0.2 m. p. k. in 30 mls of castor oil. This result can hardly be regarded as a true case of synergistic action, something Hall and Foster have regarded as not present in the anthelmintic action of these drugs, but it is possible that treatments given in this fashion do allow one drug to supplement the other. As was noted already, the chloroform probably passes down the digestive tract promptly, mixed with the purgative, and is followed shortly afterward by the chenopodium. It is quite possible that worms that are not removed by the chloroform, but are weakened by a sub-lethal dose, succumb to the additional toxic effects of the chenopodium to which they are later subjected. Or it may be that some hookworms not killed by the chloroform are deprived of their fatty protective coating by the chloroform and so exposed to attack by chenopodium, or loosen their attachment to the mucosa, under the influence of the chloroform, and are caught in the lumen of the gut by the chenopodium. Unfortunately, we have only speculation on this subject at present. That the combination was efficacious here, however, is not a matter of speculation.

A consideration of the condition of the digestive tract in these animals shows the following: Leaving out of consideration Dog 41, which was too sick to tolerate treatment and cannot be regarded as a normal animal, 6 dogs had normal digestive tracts, 3 had inflamed digestive tracts, and 6 had hemorrhagic digestive tracts. Since the anthelmintic treatment was the same for all, the reason these findings may be sought in the purgation employed, since the eliminative and distributive action of such drugs as castor oil has been found protective by the writer against lethal doses of such drugs as chenopodium or

oleoresin of male fern, whereas the tendency of olive oil to remain in the stomach and be absorbed has been found to result in serious damage to that organ. These findings, published elsewhere by the writer, are confirmed by the findings here. Where castor oil alone was used, the digestive tract was normal five times and inflamed once; where olive oil was used, alone or with a diverse assortment of purgatives, the digestive tract was hemorrhagic six times and normal once; where other oils, cocoanut or linseed, were used, the digestive tract was inflamed twice. These findings confirm the desirability of using castor oil as a purgative with chenopodium, something which a number of writers have advised, though some have given a preference to Epsom salts. It is likely that either are satisfactory; the important thing is prompt and adequate purgation.

In the following experiments, the dose of chenopodium was cut to half the therapeutic dose of 0.1 m. p. k., or 0.05 m. p. k., the dose of chloroform being the same as in the preceding experiments.

Dog No.	Wt.—Kilos.	Chen.—Mms.	Chlor.—m.p.k.	Purgative	Efficacy (%) Against				Digestive Tract
					Ascaris	Hook-worms	Whip-worms	Tape-worms	
39	6	5	0.2	Ol. ric. 30 mls.....	100	75	....	....	Normal
42	14	10	"	Ol. ric. 60 mls.....	75	83	0	....	Ent. hem.
43	8	5	"	Ol. ric. 60 mls.....	100	....	0	100	Normal

In this diminished chenopodium dosage, the treatment removed 8 of a total of 9 ascarids (an efficacy of 89 per cent); 8 of 10 hookworms (80 per cent); none of 11 whipworms (0 per cent); and both of 2 tapeworms (100 per cent). While this is a good showing for ascarids, numerous experiments indicate that this smaller dose of chenopodium, 0.05 m. p. k., will fail in a distinctly larger number of cases than the larger dose of 0.1 m. p. k., and as this latter is well tolerated, it should be used. The efficacy of the treatment against hookworms is unimpaired, a showing in keeping with the undiminished chloroform dosage of 0.2 m. p. k.

The digestive tract was normal in 2 of the 3 dogs, and showed some enteric hemorrhage in the third. Castor oil, in 30 and 60 mil doses, was used.

One dog, No. 47, was given the therapeutic dose of chenopodium, 0.1 m. p. k., and a diminished dose of chloroform, 1.33 m. p. k. This dog weighed 15 kilos, received 20 minims of chenopodium, 2 mils of chloroform, and 60 mils of castor oil. It passed 6 ascarids and had 3 whipworms postmortem, an efficacy of 100 per cent against ascarids and 0 per cent against whipworms. There were some inflamed areas and some hemorrhage in the intestine.

In another series, the dogs were given double the therapeutic dose of chenopodium, or 0.2 m. p. k., with a therapeutic dose of chloroform, 0.2 m. p. k.

Dog No.	Wt.—Kilos.	Chen.—Mms.	Chlor.—m.p.k.	Purgative	Efficacy (%) Against				Digestive Tract
					Ascaris	Hook-worms	Whip-worms	Tapeworms	
49	14	40	0.2	Ol. gossyp. 60 mils.....	100	....	....	....	Ent. inflam.; pyloric hem.
50	12	35	"	Ol. ric. 30 mils.....	100	....	0	0	Gast.-ent. hem.
51	6	15	"	Ol. sesam. 60 mils.....	100	0	....	....	Ent. hem.
52	6	15	"	Ol. arach. 60 mils.....	100	....	0	0	Gast. hem.

With this doubled dosage of chenopodium, the treatment removed all of the 35 ascarids present (100 per cent), and none of the other worms, including 1 hookworm, 10 whipworms, and 24 tapeworms (0 per cent). In the experiments already noted, chenopodium in doses of 0.1 m. p. k. and 0.05 m. p. k. removed 160 ascarids and failed to remove 5. While it might be thought that this established the larger dosage as the preferred one, it really does not do so. Experiments published by Hall and Foster show that chenopodium, in single doses of 3 m. p. k. or 3 doses of 0.2 m. p. k. each on successive days, will fail to remove occasional ascarids, and these failures are to be attributed, in the present state of our knowledge, to conditions of which we are unaware and over which we have at present no control. No safe dose of any anthelmintic known can be depended on to remove all worms present every time. This fact, coupled with the fact that anthelmintics are toxic substances which should be used with caution, makes the employment of the 0.1 m. p. k. dose of chenopodium advisable. The occasional deaths of weak animals, following the administration of conservative thera-

peutic doses of anthelmintics, inclines one to avoid larger doses than are necessary for reasonably dependable results, and these results can be obtained against ascarids with the 0.1 m. p. k. dose of chenopodium.

These single doses of chenopodium and chloroform removed a total of 43 out of 51 hookworms, an efficacy of 84 per cent. This is a very good showing against a worm that is difficult to remove, and these two drugs administered in the manner noted, give results superior to those obtained as a rule with either drug alone or with drugs other than these.

The failure of most treatments in these experiments to remove whipworms or tapeworms is to be expected. The drugs and the mode of administration are not appropriate for these worms.

The following experiments are intended to determine the efficacy of *repeated* doses of chenopodium and chloroform.

Dog No. 46, weighing 25 kilos, was given 20 minims of chenopodium in the soluble elastic capsule, with 2 mils of chloroform in hard capsules and 60 mils of castor oil. Six days later the dog was given 75 minims of chenopodium in soluble elastic capsules, with 5 mils of chloroform in 60 mils of castor oil, and six days later the dog was given this same dose again. Five days later the dog was killed. No worms were passed and 5 whipworms were found postmortem. Even such rather large doses, repeated at these intervals, were 0 per cent effective against whipworms, which is not surprising in view of the location of these worms.

In the following experiments, the dogs were given 3 doses of oil of chenopodium in soft, or soluble elastic, capsules, each dose consisting of the amount shown in the table and being given with 15 mils of castor oil or without the oil, as indicated. The last dose was followed after an interval of 1 to 1½ hours by 4 mils of chloroform in 15 mils of castor oil if the chenopodium was given with oil each time and 30 mils if no oil had been given. These experiments, briefly tabulated here, were published in full by Hall (1919).

Dog No.	Wt.—Kilos.	Chen.—Mms.	With ol. ric.	Efficacy (%) Against				Digestive Tract.
				Ascaris	Hook-worms	Whip-worms	Tape-worms	
289	21	10	Yes.....	100	86	.....	.....	Gast.-Ent. hem.
301	15	10	Yes.....	100	97	.....	.....	Gast. inflam., Ent. hem.
300	18	5	No.....	.....	50	.....	0	Few ent. petechiae.
292	14.5	5	Yes.....	.....	97	.....	0	Gast. inflam.

From an anthelmintic standpoint, this treatment was decidedly successful. It removed 6 out of 6 ascarids (100 per cent) and 127 out of 142 hookworms (89 per cent). In the 3 cases where the capsules were given with castor oil, the treatment was 91 per cent effective against hookworms. There were no whipworms present, and it failed to remove any of 17 tapeworms, a matter of no moment, as it is not a *tæniafuge* anyway.

As regards the effect on the host, it was especially bad in the case of Dog No. 301, but this dog had distemper when treated and died on the third day after treatment. The writer has pointed out elsewhere that dogs having distemper should not be given anthelmintic treatment until after they have recovered. While there was a production of inflamed and even hemorrhagic areas in the mucosa of the stomach and intestines, the condition was not serious and would have cleared up in the course of 10 days or two weeks. Compared with the damage done by hookworms, this is something that may be tolerated, and in view of the high degree of efficacy attained, the treatment outlined here would be the one indicated. It will be noted that where castor oil was not given with each dose of chenopodium, the efficacy fell to 50 per cent. The writer prefers the simultaneous administration of castor oil with the capsules. Our experiments show that the capsules given with castor oil will open in a half hour or so, so that the worms are first subjected to chenopodium and later to chloroform.

In the following experiments, dogs were given soluble elastic capsules each containing 5 minims of chenopodium and 10 minims of chloroform. The first series given will consider those dogs, 4 in number, which received 1 dose of these capsules, and the second series will consider those dogs, 11 in number, which received repeated doses.

The following dogs received these capsules to the number stated, followed immediately by 30 mils of castor oil.

Dog No.	Wt. Kilos.	Capsules	Efficacy (%) Against				Digestive Tract.
			Ascaris	Hook-worms	Whip-worms	Tape-worms	
95	14	4	.....	.....	0	.....	Inflam.
96	17	4	.....	0	0	0	Normal
97	9	2	.....	.....	0	0	Pyloric hem.
98	12	1	.....	53	.....	0	Gastric hem.

There were no ascarids present in these dogs. The treatment removed 8 out of 19 hookworms, an efficacy of 42 per cent. It failed to remove any of 9 whipworms and 44 tapeworms, an efficacy of 0 per cent against these worms. The digestive tract was normal once, inflamed once and there were hemorrhages in the stomach twice.

Apparently the combination of chenopodium and chloroform in the soft capsule is not as effective as the administration of chenopodium in the soft capsule, with the practically simultaneous administration of chloroform in the hard capsule or dissolved in the accompanying castor oil, or with the chloroform administered after an interval. Furthermore, the effect on the stomach suggests that where these two drugs are thoroughly dissolved in one another, the chloroform may hasten the local absorption of the chenopodium with bad results. It is probable, from other experiments, that the castor oil that might serve as a protection to the stomach against this combination, has passed out before this capsule opens. Probably the chloroform exerts a hardening effect on the gelatine. At any rate, the *simultaneous* administration of chenopodium and chloroform in this manner gives inferior results as regards worms removed and effect on the digestive tract, when compared with their practically consecutive administration as attained by the use of the soft capsules for the chenopodium only.

The following series comprises dogs receiving repeated doses of the soft capsules containing 5 minims of chenopodium and 10 minims of chloroform. All dogs received 1 capsule at a dose and 30 mils of castor oil with each dose.

Dog No.	Wt. Kilos.	Doses	Intervals	Efficacy (%) Against				Digestive Tract
				Ascaris	Hook-worms	Whip-worms	Tape-worms	
245	13	2	3 days.....	100	25	.....	.....	Normal
243	10.5	2	4 days.....	.....	100	.....	.....	Normal
238	9	3	4 & 3 days.....	100	42	90	.....	Gast.-Ent. hem.
239	10.5	5	4, 3, 4 & 2 days..	.....	75	79	100	Gast.-Ent. hem.
230	8.5	5	4, 6, 5 & 2 days..	100	89	.....	.....	Gast. hem.
183	11.5	6	(In 8 days).....	100	.....	.....	0	Gast.-Ent. hem.
184	5.5	7	(In 8 days).....	.....	.....	.....	.....	Gast.-Ent. hem.
182	8	7	(In 8 days).....	100	.....	.....	.....	Gast.-Ent. hem.
181	13	7	(In 8 days).....	.....	100	100	.....	Gast.-Ent. hem.
177	15	7	(In 8 days).....	.....	.....	100	.....	Gast. hem.
175	19	7	(In 8 days).....	.....	100	.....	.....	Gast. hem.

These treatments removed 56 out of 56 ascarids (100 per cent); 45 out of 64 hookworms (70 per cent); 50 out of 59 whipworms (85 per cent); and 1 out of 2 tapeworms (50 per cent). The digestive tract was normal twice, following 2 doses, and showed gastric hemorrhage in the other 9 dogs, following 3 to 7 doses, coupled with enteric hemorrhage in 6 of these cases.

A consideration of the above table and summary indicates that repeated doses of soft capsules containing 5 minims of chenopodium and 10 minims of chloroform are entirely efficacious against ascarids, as would be expected. They are only 70 per cent effective against hookworms, a high efficacy compared with chenopodium or chloroform alone in single doses, but not so high as the efficacy (87.5 per cent) attained by single dose treatments where oil of chenopodium is given at the rate of 0.1 m. p. k. in soft capsules, and chloroform is simultaneously given at the rate of 0.2 m. p. k. in hard capsules with 30 mils of castor oil or dissolved in the castor oil, or the efficacy (89 per cent) of 3 doses of chenopodium at hour intervals followed by chloroform 1 to 1½ hours later. It may be noted that in these repeated doses the individual dose was less than the therapeutic dose of 0.1 m. p. k., as it must be in repeated doses. At the same time, the condition of the digestive tract indicates that this combination of drugs is not well suited to repeated doses, being too irritant. The high efficacy against whipworms (85 per cent) is to be expected, as the keynote to treatment for infestation with this worm is repetition, a fact that the writer has pointed out in previous articles. The irritant character of chenopodium and chloroform makes them unsuitable for repeated doses and they are best used in single dose

treatments or treatments calling only for repeating doses during the course of a few hours of one day. Santonin, on the other hand, has too little efficacy in single dose to be as valuable as chenopodium for ascarids and is of no value for hookworm treatment, but the fact that it does not act as a gastro-intestinal irritant makes it the drug of choice where whipworms are concerned, since it can be safely given in the repeated treatments which are necessary to ensure some of the drugs finally entering the cecum and removing the worms (safely, that is, so far as gastro-intestinal irritation is concerned).

Experiments with these soft capsules, containing 5 minims of chenopodium and 10 minims of chloroform, after they had been enteric-coated by exposure to formalin, have been detailed in another paper. The results were unsatisfactory.

SUMMARY.

The best results in the removal of hookworms by a single dose treatment of which the writer is aware, were obtained by the use of oil of chenopodium in a dose approximating 0.1 m. p. k., as near as the dose can be approximated in 5- and 10-minim soft, or soluble elastic, capsules, followed immediately by 30 mils of castor oil containing chloroform at the rate of 0.2 m. p. k. or with this amount of chloroform given in hard gelatine capsules. Apparently the results so obtained are due to consecutive action which approximates treatment by repeated doses, as the chloroform in castor oil acts very promptly against the worms, and the chenopodium only after its release at some interval from the soft capsule. The treatment was 87.5 per cent effective in tests on 15 dogs, of which 6 had hookworms.

This same treatment was 97 per cent effective against ascarids in tests on 15 dogs, of which 9 had ascarids.

The treatment was comparatively ineffective against whipworms, which require repeated treatments, not single treatments.

The treatment was also ineffective against tapeworms, but neither of these drugs is dependable against tapeworms.

Very satisfactory results were also obtained by administering 3 doses of 5 or 10 minims of chenopodium in the soft capsule at hour intervals, accompanied each time by 15 mils of castor oil, and followed 1 to 1½ hours later by 4 mils of chloro-

form in 15 mils of castor oil. This treatment was 91 per cent effective against hookworms in tests on 3 infested dogs.

The same treatment was 100 per cent effective in tests on 2 ascarid-infested dogs and may be depended on to maintain substantially this efficacy.

These results bear out the claims of Schüffner and Verwoort for the treatment used by them in Sumatra. They gave 3 doses of oil of chenopodium, in 16-minim doses on sugar, at hour intervals and 2 hours after the last dose gave 17 grams of castor oil and 3 grams of chloroform. Our experiments indicate that the patient is better protected when each dose of chenopodium is accompanied by castor oil, otherwise a treatment approximating treatment used by Schüffner and Verwoort should be the best treatment for hookworms in man of those yet published, so far as our experiments indicate.

The simultaneous administration of chenopodium and chloroform by giving a soft capsule containing both of these drugs in the proper proportion, is unsatisfactory. In single dose the combination does not display enough efficacy, and in repeated doses the efficacy is less against hookworm, the particular work for which this combination is intended, than the single dose using soft capsules for the chenopodium only. It shows the increased efficacy against whipworms that may be expected from repeated doses, but shows a corresponding degree of injury to the gastro-intestinal mucosa that makes it undesirable.

REFERENCE.

Hall, Maurice C. 1919. Practical methods of treatment for worm infestation. Jour. Amer. Vet. Med. Assoc., v. 8 (1), April, pp. 24-45, 1 fig. .

A special course on Humane Laws and Regulations, under the auspices of the American Red Star Animal Relief, will be instituted in October at the New York State Veterinary College, New York University. Dr. W. W. Yard, of Denver, Colo., late of the Army Veterinary Service, will deliver this series of lectures.

Dr. Cheston M. Hoskins, Vety. Dept. University of Pennsylvania, will lecture this session upon Feline Medicine at the New York State Veterinary College, New York University.

CLINICAL AND CASE REPORTS.

AN ESTIMATE OF THE NUMBER OF CYSTS IN A CASE OF PORK MEASLES.

MAURICE C. HALL, Ph. D., D. V. M.
Senior Zoölogist, U. S. Bureau of Animal Industry.

Through the courtesy of Dr. H. K. Walter, the local inspector in charge at Washington, D. C., the attention of the writer was called to a case of pork cysticercosis at the abattoir at Rosslyn, Va. The animal in question had been held by the inspector, Dr. Wm. F. Davis, on July 17, 1919. An examination of the carcass showed the following:

The carcass was that of a young animal, weighing, with the head and viscera removed, 56 pounds. The meat was riddled with cysticerci and the skin raised in places, notably about the shoulders, by the accumulation of cysts. All the customarily infested sites, such as the tongue, diaphragm, psoas, neck muscles and heart, were heavily infested, but there was little to choose between these portions and the hams, shoulders, and other portions of the skeletal musculature. As usual in such cases various other viscera as well as the heart were also involved in the infestation, including the esophagus, thoracic and cervical lymph glands, stomach, spleen, and cerebrum. No cysts were found in the cerebellum, spinal cord, lungs, liver, kidney, small intestine, or abdominal lymph glands. The eye muscles and orbital tissues were affected but no cysts were found in the interior of the eyeball.

This case offered an opportunity of making an estimate of the number of cysticerci that might be present in a case of heavy infestation. A piece of ham, weighing 5 grams, was dissected and the cysts, 70 in number, removed. The remaining muscle weighed 2.5 grams, showing that approximately half the weight of the muscular portion of the carcass was made up of parasites. In 56 pounds of eviscerated headless carcass, it would be conservative to say that the musculature made up more than half the weight. Chauveau states that the skeletal musculature makes up half of the body weight. In this animal there was very little fat of any sort and the viscera were re-

moved, as was the head, with its considerable bone content. Figuring that 30 pounds of the entire carcass was muscle, including the diaphragm and heart, this would total 30 times 453.5 grams, or 13,605 grams. Since 5 grams contained 70 cysts, 1 gram would contain, on an average, 14 cysts. The total for the carcass would be, therefore, 190,470 cysts. Stiles has stated that in heavy infestations as many as 20,000 bladderworms may occur in a single carcass; in this case there are apparently almost ten times as many, and the infestation is in a rather small animal. Vosgien states that 3,000 or more cysts have been found in man.

In heavy infestations, according to Stiles, the pork is watery and pale, it decomposes easily, and has a disagreeable sweet taste. In the carcass in question the meat itself was watery, but it was difficult to ascertain this fact from a gross specimen, as the cut of a knife brought away a stream of fluid from the numerous cysts opened by the cut.

Pieces of the ham were boiled and others fried to ascertain the appearance of the meat when cooked. In boiled ham the conspicuous things noticed were the cavities, where the meat had cooked firm and the cysts had fallen out or broken, and the floating shreds of cysts projecting from the meat or free in the water. In fried ham, the cysts usually opened, sometimes with a pop, and then shriveled, the cysts or their scolices showing as white knots in the meat.

IRIS POISONING OF CALVES.

E. A. BRUCE, Agassiz, B. C.

No cases of actual poisoning of stock by iris appear to have been reported. Long mentions that the wild flag was noted by Linnæus as dangerous to cattle, Lander that poisoning of animals is rare, and Pammel cites no instances of stock poisoning. Cases are on record where human beings have been poisoned by *Iris versicolor* (blue flag) which had been eaten in mistake for *Acorus calamus* (sweet flag), owing to the close resemblance of the plant before reaching the flowering stage. Many other species of *Iris* are under suspicion as irritant poisons. They contain acrid resins and an active principle iridin, a glucoside belonging to the group of vegetable purgatives.

Quite recently some interesting cases were drawn to my attention by Mr. J. Heath of Abbotsford, B. C., a keen and careful observer. While I was not fortunate enough to see these cases personally, the information supplied by Mr. Heath coupled with the fact that there was abundant evidence that iris had been eaten, leave but little doubt as to the cause of the trouble.

HISTORY.

Nine Holstein-Jersey grade calves from 3 to 6 months of age were placed in an enclosure about half an acre in extent, and which contained a flower border. After the animals had been in this enclosure for four days, three of them were taken sick, the ages of those affected being 3, 4, and $4\frac{1}{2}$ months respectively. Two of these died in less than two days, and the third died on the fourth day. Examination of the grounds showed that two clumps of iris roots were exposed and had been eaten off close to the ground; a peony had also been eaten down. The iris roots that remained were removed and no further trouble occurred.

At some future time it is hoped that the botanical name of the iris in question may be ascertained, for the present it must suffice that it was a blue flowering bulbous variety.

At first a tendency to lie down and keep quiet was noticed, together with a considerable salivation. Shortly after salivation made its appearance the glands of the head and throat became hard and enlarged, and raised sores appeared on the lips and muzzle. These sores are described as being of the nature of burns, and varied in size from that of a 25 cent piece to that of a silver dollar. They were slightly raised yellowish scabs to begin with, then became darker, and were a source of intense irritation as the animal made frequent attempts to scratch them.

Salivation was continuous. Vomiting was not noticed. Undue thirst was not marked, and the appetite was not affected for some little time after being taken ill. Acute abdominal pain was evidenced. There were no convulsions or unconsciousness. Shortly before death the fæces became very loose and contained blood. For about the last hour the animals were practically unable to move.

AUTOPSY.

A post-mortem was held ten minutes after death on the third calf that died. The first two stomachs were said to be

more or less normal in appearance, but the others showed unmistakable signs of irritation. The kidneys, liver, and spleen were very dark in colour. The large intestines showed black patches varying in size from half an inch to six inches; the small intestines were similarly affected but to a much lesser extent.

REMARKS.

The post-mortem findings although meagre, in conjunction with the symptoms all point to the action of an irritant poison. Abundant evidence existing that iris plants had been eaten, together with the fact that nearly a month has elapsed since the removal of the iris plants from the enclosure without subsequent cases, all points to the cause of death as being due to poisoning by iris.

REFERENCES.

- Henkel, Alice. (1907). American Root Drugs. Bull. 107, U. S. Dept. of Agr.
Kræmer, H. (1915). *Scientific and Applied Pharmacognosy*. Philadelphia.
Lander, G. D. (1912). *Veterinary Toxicology*. Chicago.
Long, H. C. (1917). *Plants Poisonous to Live Stock*. Cambridge.
Pammel, L. H. (1911). *Manual of Poisonous Plants*. Cedar Rapids, Iowa.

GEMS OF TRUTH.

When a plumber makes a mistake, he charges twice for it.

When a carpenter makes a mistake, it is just what he expected.

When a lawyer makes a mistake, it is just what he wanted, because he has a chance to try the case all over again.

When the Doctor makes a mistake, he buries it.

When a judge makes a mistake, it becomes the law of the land.

When a preacher makes a mistake, nobody knows the difference.

But when an editor makes a mistake — Goodnight !

— *National Provisioner*.

ABSTRACTS.

AN INTERESTING CASE OF ADAMS' OPERATION FOR PARAPHYMOSIS AND MALFORMATION OF THE PENIS AFTER CASTRATION.

By FREDERICK HOBDAY, F. R. C. V. S.,
London.

The patient was a valuable riding horse, five years old, which had been castrated by Mr. John Young, F.R.C.V.S., by whom I was called in consultation. The operation had apparently passed off satisfactorily, but, as a sequel, paraphymosis had set in, and the end of the penis was now turned backwards, the horse being unable to retract the organ into the prepuce. This withdrawal into the prepuce was particularly prevented by an irregularly indurated ring of tissue, about four inches thick in the front and two inches at the back, extending all around the organ itself. The front portion had already become abraded owing to friction with the abdomen, and a large sore, fully the size of a couple of crown pieces side by side, had already formed.

The horse was cast and chloroformed, *Adams' operation being performed, and the whole of the indurated ring of tissue carefully dissected off. The edges of the mucous membranes at the top and bottom of the penis were then carefully united with interrupted sutures, and the whole was painted with iodine. As soon as the patient got up off the ground the penis was withdrawn naturally into the sheath, and recovery has since been complete.

This operation, which was first performed in America, is a most useful one, and was introduced into the British Army Veterinary Hospitals with great success. In France, especially during the bad weather of the winters and springs of 1916 and 1917, owing to the debility of the animals and the frightfully cold and muddy conditions under which the horses were compelled to exist, hundreds of cases of paralysis of the penis were met with. In some necrosis occurred as a complication, and all

*Dr. Jno. W. Adams, University of Pennsylvania.

were frightfully troublesome. In a very large proportion of cases, even when the horses recovered condition, this paralysis of the penis still existed, and rendered the animal unfit for further war service. Amputation did away with the pendulous penis, but the risk of stricture was ever present, and Adams' operation came as a "godsend." It was beneficial in a very large proportion of cases, especially those in which there was a heavy roll of indurated tissue around the penis, the weight of this being often very considerable. Once this was removed, the beneficial result was most marked, and in many instances in even a few days the penis was able to be retracted into the prepuce. Its simplicity, safety and freedom from hæmorrhage, together with the large proportion of success which followed its performance, has made this operation take its place amongst the neat and practical operations of veterinary surgery, and our thanks are due to our American *confreres* for their originality and for the lead they have given us in this branch of the veterinary art.—*Veterinary Journal*.

ANTHRAX IN MOROCCO.

Chauveau's researches showed that Algerian sheep were resistant towards the anthrax bacillus of French origin. This conclusion has wrongly led to a belief among agriculturists that anthrax in the sheep did not exist in Algeria. The recent work of Léhritier, Fléry and Tribout (1912) has shown that the disease can be observed among Algerian sheep and that death is produced under conditions similar to those observed in outbreaks among French flocks, but the bacillus of Algerian origin is endowed with greater virulence than the French organism. Martin and Henry (1916) have shown that anthrax is not rare in the region of Constantine but outbreaks become manifest under atypical fulminant forms which render diagnosis very difficult.

Anthrax is common in Morocco and has been recorded by veterinarians as being widespread in many districts. It is well known by the natives, but, as in Algeria, it is often mistaken by even enlightened Europeans. It makes its appearance after the harvests at the time when land upon which cereals have been cultivated is turned into pasture. Isolated cases of the disease occur very frequently but it may become more or less

epizoötic in character although this is somewhat rare; this circumstance was observed in the case of cattle imported in 1913 and 1914 from Argentina and Portugal for the needs of the army of occupation. In such instances deaths occur regularly as in a true epizoötic but several days may elapse without observing a single death and then the disease re-appears. It always runs a hyper-acute course lasting only a few hours. The affected animals show only a few ill-defined symptoms. On post-mortem examination no lesions are often to be found. The spleen may be just appreciably enlarged and some petechiæ may be seen on the serous membranes. At the Casablanca abattoir Eyraud was able on several occasions to diagnose anthrax in cattle and sheep which showed only a few interstitial hæmorrhages.

The above hyper-acute form of anthrax has been observed in horses as well as in cattle. Microscopic examination systematically carried out enabled the author to discover the rôle of the anthrax bacillus in certain diseases of a fulminant character appearing in the form of an epizoötic among flocks of sheep, where the disease would not have been suspected on clinical or post-mortem examination. — VELU (H.). — *Bull. Soc. Path. Exot.* 1919. Mar. 12. Vol. 12. No. 3. pp. 126-127.

COLLOIDS.

The following is an extract from a Chadwick Public Lecture on "the use of colloids in health and disease," by A. B. Searle, given at the Medical Society of London on Wednesday, Feb. 26th: Sir William J. Collins, K.C.V.O., M.D., Chairman of the Chadwick Trustees, in the chair.

"Very remarkable results have been obtained during the past few years from the study of a state of matter which is intermediate between that generally recognised as "suspended" in a fluid and that in a true solution, and known as the colloidal state. Many substances of widely different composition and characteristics can be obtained in this state and their properties then differ in many ways from what would be anticipated.

The particles of colloidal matter are very minute, but by means of the ultra-microscope they may be recognized as endowed with violent motion. Many factors conducive to health

depend on the possession of a colloidal character; thus the purification of sewage depends almost wholly on its ability to form a colloidal solution with the grease and dirt. The researches of the late Henry Crookes—a son of Sir William Crookes—have proved the very effective germicidal power of elementary colloids; strikingly shown by a number of lantern slides of cultures of bacteria. This germicidal property soon led to their being employed as medicines as well as germicides—with remarkable results. Crookes' work has been followed by further investigations which have resulted in the preparation of silver, copper, mercury, manganese and palladium, and of such non-metallic elements as iodine and arsenic in the form of colloidal solutions which are isotonic with the fluids of the human body. These researches have made available a new series of liquids of great importance in the treatment of some of the most serious diseases. Amongst their most striking characteristics are their freedom from poisonous properties which render the same substances risky when administered in the form of ordinary solutions. Large doses of colloidal solutions may be given with impunity, and cures which are ordinarily prolonged, are effected rapidly.

Although the first remedial germicidal colloidal metals were first prepared in 1910, the rapidity with which they and other colloidal solutions have been adopted, and their extensive use in practice is a certain indicator of their value. Attempts to produce similar preparations were made by several German chemists, but most of the foreign preparations lack stability, and are decomposed before reaching the seat of the disease. The British colloidal solutions on the contrary are quite stable and effective.

The success which has attended investigations on the use of colloids as remedial agents is great and affords a basis of hope that further developments will be still more beneficial. It is probable that serum and vaccine thereby will ultimately be resolved into questions of colloidal chemistry, but in the meantime the use of colloidal solutions of certain elements appears to offer a means whereby they can be accurately prepared and administered with a higher degree of efficiency than is possible with some of the more complex synthetic compounds at present in use."—*Vet. Rec. (Lond.)*

SOME NOTES ON THE FEEDING OF FLESH TO FARROWING SOWS AND THE HABITS OF PIGS.

By C. MORGAN, M. R. C. V. S., D. V. H.
Puerto Cabello.

Is it unreasonable to suggest that a certain class of diet (such as one containing a large amount of half-cooked meat, which in packing-houses is termed tankage) has a tendency to develop a kind of cannibal habit in breeding sows? Several weeks ago a number of breeding sows were fed on tankage as well as on maize. Two of these, about two years old, farrowed litters of strong, healthy pigs, but within the course of twenty-four hours they killed and partially ate them all. The two animals were in excellent condition, and with abundance of milk. We then turned the two sows loose to a large pig-pen where other sows had their litters of pigs of various ages. The two sows had their udders distended with milk. Each of them did not rest until they enticed a litter each of young pigs, about a month old, away from other two sows. These two animals got so fierce that neither human beings nor any other pigs dared approach them. The result was that the udders of the other two sows got dry, and their young pigs clung to their foster-mothers and entirely ignored their own mothers. These foster-mothers caused more violent disturbance and noise than all the other pigs in the pen, which were about one hundred in number. They had previously, before being bought this time, bred two litters of pigs, but they were never fed on a meat diet until they were bought by the present owners.

I am inclined to believe that the custom of feeding these sows on the semi-cooked meat was the cause of developing this cannibal craving. In spite of all this, the maternal instinct was stronger than ever, otherwise they would not have robbed the other two sows of their pigs.

Cases are on record of mare-mules secreting milk in their udders to such an extent as to influence them to rob mares of their foals. This is also quite a common occurrence amongst sheep.

It is a well-known fact that pig-breeders have reasons to believe that feeding breeding-sows on raw meat has a tendency to develop bad habits, such as killing chickens, ducklings, and

even newly-born lambs. I know of several instances where old breeding-sows have entered cowsheds and ravenously eaten part of the cleansing of newly-calved cows. The pig is an omnivorous animal, and when hungry will devour almost anything that comes across its path, whether clean, unclean, alive or dead. The older the animal the more of these bad habits it develops. The pigs in Great Britain have far more attention paid to their welfare than used to be the case. It was often a custom in some districts to turn the breeding-sow out of doors a few weeks after farrowing to search for part of her scanty diet, and then it was even dangerous to turn young children out of doors in case they might fall the victims of this voracious cannibal. Most people now have come to realise that the pig, like other domesticated animals, should be properly fed, and kept clean, as the better the hygienic environment the better will the pig thrive and pay. A pig, as we all know, is almost destitute of reason. A circus animal-trainer told me once that he possessed patience to such an extent as to even train fleas to perform certain feats, but that his patience was not sufficient to make a successful stage performer of the pig. Yet the pig is gifted with a certain amount of what we might term selfish animal cunning. Anyone who has seen one of these intruders in a ripe corn-field, with eyes and ears upon the alert, will know that this animal possesses enough cunning to realise that he is a trespasser. Nevertheless, in spite of all his vigilance, it is not of much advantage to himself individually, as he always utters a loud grunt at the approach of a human being, and off he scampers through the rustling corn.

"Yes, I would certainly keep a pig," says "Alpha of the Plough." The idea came to him while he was digging his allotment, and the same day he met the farmer's wife and encouraged her to talk on the thrilling theme. He went indoors, and the first thing that caught his eye was an article on "The Cottager's Pig." He imbibed it with the frenzy of a new religion, and rose filled to the brim with lore about the animal to whose existence (except in the shape of bacon) he had been indifferent so long. Yes, it was a patriotic duty to keep a pig. He was an ally in the war. He saw the whole German staff turning pale at his name, as Mazarin was said to turn pale at the name of Cromwell. By night he could have held his own

without shame or discredit in any company of pig-dealers, and in his dreams he could see the great globe itself resting on the back of a pig.

[Irritability and excitement at the time of parturition may bring on transitory dementia in some sows and cause them to kill and eat their litters. Other reasons for the act have been ascribed to lack of flesh diet and consequent liking for it, hereditary vice, deficiency of lime salts in the food, etc. Some sows kill their youngsters and do not attempt to eat them. — SUB-EDITOR.] — *Vet. Journ.*, (Lond.).

BOVINE ADAMANTINOMA.

H. Horne published a clinical and histological description of this case in the *Deutsche Tierärztliche Wochenschrift*. In a six-year-old cow of Danish breed, a tumor had developed rapidly in connection with the lower jaw near the incisor teeth; and had deformed the whole region and displaced the teeth towards the left side. The cow was in good condition, and showed no general signs of disturbance; but, as the tumour was growing rapidly, the owner sent her for slaughter. As nothing was known at the abattoir concerning the development of the tumour, actinomycosis was suspected; and the tumour was sent to Horne for examination.

Examination showed that the anterior portion of the lower jaw was transformed into a round body which the lower lip could not completely cover, so that part of it was visible through the semi-opened mouth. The tumour was asymmetrical, being more voluminous to the left than to the right. Its measurements were 10 x 12 x 17 centimetres; and it weighed, together with the lower lip adhering to it, 1250 grammes.

To the touch, the tumour presented almost woodlike hardness in its superficial parts, but was a little more soft in its depth. A longitudinal section showed that the whole tumour was infested by a bony layer which was especially hard and thick where it joined the incisor teeth, while it diminished in the posterior portion of the tumour. Beneath this layer the tumoural mass was composed of round and oval islands. Its tissue was consistent, almost transparent, and was divided by means of

bands of connective tissue into small cavities or spaces in which a gelatinous or muco-œdematous mass was disposed.

Microscopically, the tissue of the tumour presented a characteristic structure. The connective tissue and the epithelium were disposed very nearly as in carcinomatous tissue. The epithelial masses formed ramified or anastomosed cords, or else more or less rounded or oval agglomerations. Each agglomeration was infested, especially at the surface, by a layer of cylindrical epithelial cells. In the smaller alveoli the epithelial cells which invested the internal face of this layer were very compressed; in the larger aveoli, however, these same cylindrical epithelial cells were transformed in the deep and central parts into ramified stellate cells. Here and there in the alveoli a decomposition of the cells with the formation of small cysts would be noted. In the midst of these epithelial elements was found a fibrillar stroma more or less rich in cells. Taken as a whole, the microscopic appearance of this adamantinoma (or ad amantoma) was very typical, and was clearly and easily differentiated from that of other species of tumour.

Cases of adamantinoma are not frequent in the domestic animals. Liénaux has seen two cases in the cat. Fölger described three cases in cattle, and Joset reported three more, also in cattle. In man, however, similar cases are not so infrequent, and are considered as a species of benign tumour of slow development, situated in the jaw.

As regards the genesis of adamantinoma, it is admitted that it takes origin from the remnants of the embryonic *primary enamel organ* or *enamel germ*; for the epithelial formations described above strangely resemble certain portions of the dental tissue, and intermediate stages between these tumours and odontomata are also met with. — *La Clinica Veterinaria*.

W. R. C. — *Vet. Record*. (Lond.)

Lieut. John R. Shands, who has spent eleven years in the Orient, principally in the Philippine Islands, Australia and China, has returned to the United States and ordered to Camp Dix, New Jersey, as Camp Veterinarian. Lieut. Shands was in Chicago on his way from Tientsin, China, to Camp Dix, and had an opportunity of familiarizing himself with some of the latest inventions of civilization.

ARMY VETERINARY SERVICE

MAJOR WILLARD F. GUARD.

In order to keep the record straight, we are pleased to correct an error concerning Major Willard F. Guard, at his request, which appeared in the August number of the Journal, although the item was published just as it came to us.

Major Guard's name should have been Willard instead of William; he sailed for France May 14th instead of April 14th; and he was promoted to the grade of Major on May 3rd instead of June 3rd, 1919.

FROM THE OFFICE OF THE SURGEON-GENERAL OF THE ARMY, WASHINGTON, D. C.

OFFICERS, VETERINARY CORPS, UNITED STATES ARMY.

	On duty	
	Aug. 11, 1919	Sept. 11, 1919
Colonels	0	0
Lieutenant Colonels	5	5
Majors	54	47
Captains	119	90
1st Lieutenants	255	187
2nd Lieutenants	178	109
Totals	611	438

VETERINARY OFFICER DETAILED TO GENERAL STAFF COLLEGE.

Lieutenant Colonel John H. Gould, Veterinary Corps, has been ordered to report to the Commandant, General Staff College, for assignment to duty to take the course at the college. The co-operation and functioning of the Veterinary Corps with all other staff departments in the movement of troops is most essential, and it is important that veterinary officers be trained with other staff officers for this duty. The care of sick animals with combatant troops, the evacuation of animal casualties and

hospital arrangements for their treatment are very essential features for the successful operation of armies, as experience has demonstrated in France. Lieutenant Colonel Gould only recently returned from France. He was division veterinarian, 88th Division, until December 15, 1918, when he was made chief veterinarian, Second Army, and, upon its disbandment, was transferred to the Third Army (Army of Occupation) as chief veterinarian and served in this capacity until his return to the United States.

APPOINTMENT OF EMERGENCY OFFICERS.

"The Chief of Staff has approved recommendations of the Director of Operations, General Staff, providing that in filling such vacancies for commissioned officers as may be provided by legislation reorganizing the permanent military establishment, it is the policy of the War Department to select appointees from among persons who served as emergency officers between April 6, 1917, and Nov. 11, 1918. Upon enactment of legislation, emergency officers still in service having approved applications on file will be examined for appointment without further action on their part. Upon enactment of legislation, former emergency officers who have been honorably discharged and in whose cases there are approved applications on file will, if eligible, be communicated with to ascertain if they still desire appointment and will be examined if they so desire. Former emergency officers who have been honorably discharged, but who at time of discharge or prior thereto did not express desire for permanent appointment may make application for examination. Persons other than emergency officers may be eligible under such legislation as is enacted, may make application for examination and will be examined if recommendations and records are satisfactory.

"No applications, other than from emergency officers still in service will be considered or filed at this time. Regardless of such preliminary or other examinations as may have been held, no appointment will be made without a thorough and satisfactory final examination. The final examination will be such as to establish the mental, moral and physical qualifications of appointee. Candidates will be examined for arm of service selected by them, within limits of legislation. Examinations will not be held for a particular grade. Examining boards will

be permitted to recommend a suitable grade or grades for appointment, but all candidates will be examined with the understanding that the grade in which appointment is tendered will be determined by the War Department from consideration of age, length and character of service and recommendations of boards."

COMMENT.

The above quoted article was published in the Army and Navy Journal, August 16, 1919. It is the first authoritative information that has been given out by the General Staff regarding the proposed plan for the appointment of emergency officers to the Regular Army.

It will be noted in the first paragraph that everything depends upon enactment of legislation by Congress. Until Army reorganization plans are definitely decided upon by the Military Committees and passed by Congress, the number of vacancies and grades that will be open in the Veterinary Corps can not be stated.

MAJOR OLAF SCHWARZKOPF, V. C., REGULAR ARMY.

Major Olaf Schwarzkopf, V. C., Regular Army, was retired from active service August 19, 1919. During Major Schwarzkopf's military and professional service he has ranked as one of the foremost veterinarians in America and upon his retirement at this time it seems appropriate to present a brief resume of his active career.

His elementary education consisted of nine years' course at the German Gymnasiums at Bromberg and Thorn where Latin, Greek, French, Higher Mathematics, General History, etc., were obligatory.

Graduating from the Gymnasium at Thorn, he entered the Royal Veterinary College, Berlin, Germany, in 1875, and received his degree from this college in 1880 after a five years' course in veterinary medicine. From graduation until 1885 he was in active practice in Germany.

In 1885 he came to the United States to act as assistant to Professor F. S. Billings, V. S., New York City. He entered the United States Army in February, 1886, as Veterinarian, 8th U. S. Cavalry, stationed at that time in Texas and served for four months at the end of the Geronimo campaign. In 1888 the 8th Cavalry made the longest march on record in the United

States Army to date when it marched overland from Fort Davis, Texas, to Fort Meade, South Dakota, a distance of two thousand miles. • Dr. Schwarzkopf was a member of the command. He resigned as veterinarian, 8th Cavalry, January 1, 1889, to accept the chair of professor of Veterinary Medicine at the Agricultural College, State University of Minnesota. He remained here until 1894 when he was appointed Dean, McKillip Veterinary College, Chicago, Illinois, at which place he stayed until 1896. In 1897 he was appointed Professor at the American Veterinary College, New York City, and remained at this institution until 1900. He was reappointed to the Army as Veterinarian, First Class, in July, 1900, and assigned to the 3rd Cavalry, for duty. He served with the 3rd Cavalry in the Philippines from 1900 to 1902, taking part in the campaign in Northern Luzon. In 1901 when the Army was reorganized, Dr. Schwarzkopf was appointed Veterinarian of Cavalry and continued to serve with the 3rd Cavalry until 1913. During his service with the 3rd Cavalry they had a second tour of duty in the Philippines from 1905 to 1907. In 1913 Dr. Schwarzkopf was detailed as Veterinary Instructor, Department of Hippology, Mounted Service School, Fort Riley, Kansas, and when the Army Schools were discontinued due to the Mexican Border trouble in 1914, Dr. Schwarzkopf again returned to the 3rd Cavalry for service in Texas until 1916. From April to August, 1916, he was recorder for the Board of Veterinary Examiners to examine all veterinarians for commissions in the Veterinary Corps organized under the Act of June 3, 1916.

He was commissioned Captain in the Veterinary Corps, United States Army, June 3, 1916, and promoted to the rank of Major, Veterinary Corps, United States Army, on September 14, 1917. In May, 1917, Captain Schwarzkopf was ordered to the Medical Supply Depot, St. Louis, Mo., as Officer in Charge of Veterinary Supplies and organized the Veterinary Division of this depot. He was stationed here until May, 1918. He was transferred to Fort Snelling, Minn., in June, 1918, as Post Veterinarian, and was at this station until September, 1918, when he was transferred to Fort D. A. Russell, Wyoming, for duty as Post Veterinarian, and was on active service there until his retirement on August 19, 1919.

Major Schwarzkopf has been a generous contributor to the veterinary journals and live stock periodicals on all matters

pertaining to the profession and livestock interests. He has always been active in advocating proper recognition for the Army Veterinary Service. In 1887 while at Fort Clark, Texas, he wrote an article entitled "The Necessity of an Organized Veterinary Corps, United States Army" and its recommendations are briefed as follows:

1. The Veterinary Corps to be attached for administrative purposes to the Medical Department of the Army.
2. That there shall be three classes of officers:
 - (a) First Lieutenant mounted.
 - (b) Captain, mounted, after ten years' service upon passing professional examination for promotion.
 - (c) Major, mounted. Chief of the Veterinary Corps to be attached to the Office of the Surgeon General of the Army.
3. The number of veterinarians to be 40, including all grades.

It must be a source of great satisfaction for Major Schwarzkopf to see the Veterinary Corps being organized as part of the Medical Department along the lines proposed by him in his first article.

Some of the articles written by Major Schwarzkopf are given below:

1. The Effect of Loco-weed—A. V. R., July, 1888.
2. National and International Meat Inspection—Proceedings, U. S. V. M. A., October, 1890.
3. American Veterinarians be Watchful. (Horse-breeding) A. V. R., July, 1897.
4. The Revival of Horse-breeding—A. V. R., August, 1897.
5. The Future of the American Veterinary Profession—A. V. R., August, 1897.
6. Docking of Horses for Fashion's Sake—A. V. R., October, 1897.
7. Veterinary Education in New York State—A. V. R., March, 1898.
8. The True Story of the Army Veterinarian—A. V. R., August, 1898.
9. The Treatment of the U. S. Army Horse in the Cuban War—A. V. R., December, 1898.
10. The Army Beef Inquiry—A. V. R., April, 1899.

11. The Schmidt Treatment of Parturient Paresis—A. V. R., June, 1899.

12. Military Veterinary Hygiene Journal, U. S. Cavalry Association, July, 1904.

13. The Structure and Function of the Horse's back and its Relation to the Form and Use of the Military Saddle—Journal U. S. C. A., September, 1910.

14. The Hygiene and Treatment of the Horses at the Manœuvre Division, Texas—Journal U. S. C. A., March, 1912.

15. The Changed Status of the Horse in War—Journal U. S. C. A., December, 1915.

TRANSLATIONS FROM THE GERMAN FOR THE MILITARY INFORMATION DIVISION OF THE GENERAL STAFF.

1. Measurements of Breeding Horses and Army Horses. By Professor S. Nathusius.

2. Packing of the Field Saddle. March, 1907.

It is with keen regret that the Veterinary Corps sees the passing from active duty of a man who has always given his untiring energy towards the advancement of the veterinary profession in the United States and the veterinary service extends to Major and Mrs. Schwarzkopf their very best wishes for a long and happy life.

The following officers have resigned from the Veterinary Corps during the past month:

Major J. J. Connolly, 2nd Lt., V. C., R. A.

1st Lieut. R. M. Sarde, 2nd Lt., V. C., R. A.

1st Lieut. B. S. Fritz, 2nd Lt., V. C., R. A.

1st Lieut. G. P. Bard, 2nd Lt., V. C., R. A.

1st Lieut. C. Van. W. Morris, 2nd Lt., V. C., R. A.

It may be of interest to our readers to know that the Veterinary Corps in France in spite of its shortcomings which have been heralded throughout the country did do excellent work with the American Expeditionary Forces and this was appreciated by Commanding Generals as the following copy of a commendation will show. It may be also stated that Major General Robert L. Howze is one of the most prominent cavalrymen of the Army and is now in command of the Mexican Border patrol with station at El Paso, Texas.

HEADQUARTERS THIRD DIVISION

A. P. O. 740 A. F. I. G.

August 6, 1919.

From: Robert L. Howze, Major General, Division Commander.

To: Jesse D. Derriek, Major, V. C., Division Veterinarian.

Subject: Commendation.

1. The 3rd Division easily won the IV Corps Animal Transport show, and now are reported by the Remount Service as being in a finer condition than any other animals received by them. This indicates that the animals of this Division were brought to the standard of excellent. It is therefore fitting that those responsible be commended.

2. The scarcity of replacements during active operations resulted in this Division arriving in Germany with many mangy and debilitated animals. Due to the efficient services of the Veterinary Officers and enlisted personnel, mange was eradicated and such animals as were not evacuated, promptly returned to the service.

3. Those Officers deserving particular mention are Captain William C. Keck, V. C., 1st Lieut. Lloyd J. Brown, V. C., 1st Lieut. R. M. Sarde, V. C. and 1st Lieut. Thomas A. Breen, V. C. These Officers during active operations in addition to their Veterinary duties, constantly inspected and supervised the horse lines, encouraging and assisting the men in caring for the animals. Since in the occupied area Captain Augustus Duncan, Inf., Animal Inspector, 6th Infantry Brigade, has rendered service of the highest character.

4. Those enlisted men deserving particular mention are Sgt. 1st class Matt A. Ellis, Sgt. James H. Rudd, Corporal William Sherman Page, Corporal Ernest L. Tompkins, Farrier Melton T. Hogan, Farrier Burl Hinds, Farrier Harry J. Stebbens, Farrier William Peter Weber, Horseshoer William W. Woods, Pfc. Dalton D. Long, Pfc. Ira R. Lambert. Sgt. 1st class Ellis with the office of the Division Veterinarian carefully carried out instructions, displaying accuracy in making reports and cheerfully did anything he could to coordinate the work of the Veterinary Corps. The above enlisted men rendered intelligent and efficient assistance to their officers and of their own accord performed many secondary duties, resulting in the saving of many animals and in the improving of the conditions of others.

5. The 3rd Mobile Veterinary Section in addition to evacuating sick and wounded animals has also rendered valuable service in bringing up replacements. On one occasion, assisted by casuats, they brought 900 animals from Tronville, France, to Mars-la-Tour, Lorraine. This was after the Division had left the former area. They have also been conspicuous in Division, Corps and Army Horse Shows.

(Signed) ROBERT L. HOWZE,
Major General, U. S. A.,
Division Commander.

Captain Duncan, an Infantry Officer, was assigned to this Division as remount officer, and by orders of General Howze was directed to report to the Division Veterinarian for duty.

INDIANA VETERINARIANS SHOW MUCH INTEREST IN STERILITY IN BREEDING CATTLE.

Dr. L. C. Kigin, Extension Veterinarian, writes that sterility among breeding cattle is a subject of unusual interest to veterinarians and cattle breeders in Indiana. The Extension Department of Purdue University has just made it possible for Indiana veterinarians to hear Dr. E. T. Hallman of the Veterinary Division, Michigan Agricultural College, discuss this important subject. The large number of veterinarians who came out to hear Dr. Hallman indicates the interest every veterinarian has in this trouble. Through the coming of Dr. Hallman to Indiana there has been awakened a new interest in veterinary science.

We all feel a debt of gratitude to the Doctor for the effective and splendid manner in which he presented his subject.

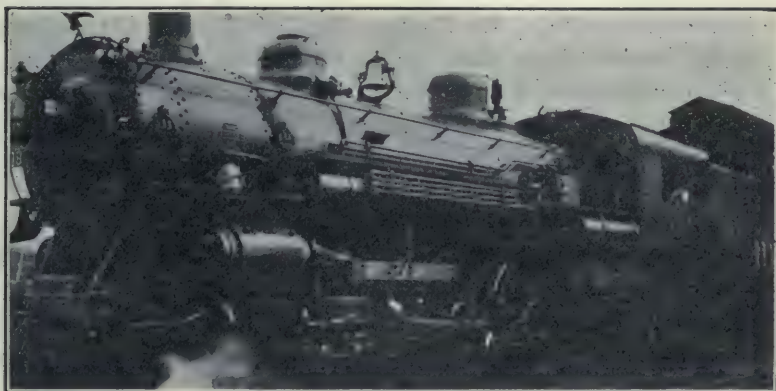
Examinations and demonstrations of treatment were carried out at many clinics arranged for the meetings. The series lasted from September 8th to 12th.

Dr. S. Brenton, of Detroit, Mich., was a recent visitor to Buffalo, N. Y.

Dr. C. J. Marshall, of Philadelphia, late of the Army Veterinary Service, after returning to his post of State Veterinarian in Pennsylvania, has resigned his official place.

ASSOCIATION NEWS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.



ALL ABOARD FOR NEW ORLEANS.

REDUCED RATES FOR THE NEW ORLEANS MEETING.

In the June and July numbers of *THE JOURNAL*, the writer briefly referred to the possibility of reduced rates for the A. V. M. A. in New Orleans, La., November 17-21st, inclusive, and particularly in the July number, page 466, a promise was made that the limit of effort would be put forth to secure rates less than 3 cents per mile for the occasion. After having had considerable correspondence with the traffic managers of the Southeastern, Western and Eastern Divisions of the United States Railroad Administration, the writer is in possession of sufficient authentic information to warrant publication to the effect that winter excursion tickets at reduced fares will be on sale, daily, beginning October 1st and continuing throughout the winter season, with final limit good reaching original starting point, returning May 31st next, and with liberal stopover privileges on the going and returning trips. These rates will be authorized to New Orleans from practically all important points in the United States.

A letter from the Eastern Division states that the proposed fares from some of the principal points to New Orleans and return are as follows:

Boston, via Albany	\$83.94
Boston, via New York	85.50
New York City	73.14
Buffalo	70.42
Detroit	61.33

The Chairman of the Eastern Division further advises that winter tourists fares from points in Indiana, Michigan, Ohio, Pennsylvania, etc., will be published on the basis of 90% of double the one way fares, but that this information is only tentative. However, the evidence at hand indicates the certainty of reduced rates.

The correspondence on file from the other Division managers does not indicate the exact reduction, but states that it will be on a low and favorable basis. It will be noted that the time limit and stopover concessions are very liberal, which should appeal to a large number of members who anticipate a visit enroute, or an extended southern vacation.

In order to avoid confusion and misunderstandings, it might be well to negotiate with the Railroad agents, immediately, for the journey and it is particularly important that Pullman reservations be purchased likewise, as traffic southward during November is likely to be rather congested.

A fare less than 3 cents a mile should be hailed as good news, and it is sincerely hoped every member will take advantage of the opportunity to attend this meeting which, from every indication, will go on record as the most important ever held.

ROUTES AVAILABLE.

To proceed to New Orleans, La., from the following points the railroads indicated are the ones available for the journey: Albany, N. Y.—New York Central R. R. to New York, N. Y., thence direct over the Pennsylvania and Southern lines.

Boston, Mass.—New York, New Haven and Hartford R. R. to New York, N. Y., thence direct over the Pennsylvania and Southern lines; or Boston and Albany to Albany, N. Y., via New York Central lines to New York, N. Y., thence direct over the Pennsylvania and Southern lines.

Buffalo, N. Y.—Erie R. R. to Cincinnati, Ohio, thence direct over the Cincinnati, New Orleans and Texas Pacific R. R., (Q. & C. Route); or Lake Shore R. R., and Big Four R. R., to Cincinnati, Ohio, thence direct over the Cincinnati, New

- Orleans & Texas Pacific R. R., (Q. & C. Route); or Louisville & Nashville R. R., or start over the Lake Shore R. R., to Chicago, Ill., thence direct over the Illinois Central R. R.
- Cincinnati, Ohio—Direct, either over the Cincinnati, New Orleans & Texas Pacific R. R. (Q. & C. Route), or Louisville & Nashville R. R.
- Chicago, Ill.—Direct over the Illinois Central R. R.
- Cleveland, Ohio—Big Four R. R. to Cincinnati, Ohio, thence over Cincinnati, New Orleans & Texas Pacific R. R. (Q. & C. Route), or Louisville & Nashville R. R., or start over the Lake Shore R. R. to Chicago, Ill., thence direct over the Illinois Central R. R.
- Denver, Colo.—Union Pacific R. R. to Kansas City, Mo., change to either Chicago and Alton R. R., Missouri Pacific R. R., or Wabash R. R., for St. Louis, Mo., thence direct over the Illinois Central lines; or from Kansas City, Mo., over the Kansas City Southern R. R. to Shreveport, La., thence direct over the Texas & Pacific R. R., or direct over the Louisiana Railway & Navigation Co., or continue through Shreveport, La., over the Kansas City Southern to Lake Charles, La., thence direct over the Southern Pacific R. R.; or from Kansas City, Mo., to Memphis, Tenn., over the Frisco lines and thence direct over the Illinois Central R. R.
- Des Moines, Iowa—Wabash lines, or Chicago, Burlington & Quincy R. R. to St. Louis, Mo., thence direct over the Illinois Central R. R.
- Detroit, Mich.—Cleveland, Cincinnati, Chicago and St. Louis R. R., (Big Four Route) to Cincinnati, Ohio, thence direct over the Cincinnati, New Orleans & Texas Pacific (Q. & C. Route), or Louisville & Nashville R. R., or over the Michigan Central R. R. to Chicago, Ill., thence direct over the Illinois Central R. R.
- Kansas City, Mo. and Kan.—Over the Kansas City Southern R. R. (See final route from Denver, Colorado).
- Louisville, Ky.—Either Louisville & Nashville R. R., or Illinois Central R. R., direct.
- Minneapolis, Minn.—Chicago, Milwaukee & St. Paul R. R. to Chicago, Ill., thence direct over the Illinois Central R. R.
- New York, N. Y.—Over the Pennsylvania and Southern lines direct.

Omaha, Nebr.—Chicago, Burlington and Quincy R. R. to Kansas City. (See final route from Denver, Colorado).

Philadelphia, Pa.—Pennsylvania and Southern lines direct.

Pittsburg, Pa.—Baltimore and Ohio R. R. to Cincinnati, Ohio, thence over the Cincinnati, New Orleans & Texas Pacific R. R. (Q. & C. Route), or Louisville & Nashville R. R. direct.

Portland, Ore.—Over the Southern Pacific R. R., via San Francisco, Cal., direct all the way.

Salt Lake City, Utah—Union Pacific R. R. to Denver, Colo., (See Denver, Colo., for completion).

San Francisco, Calif.—Southern Pacific R. R., or Frisco lines direct all the way.

Seattle, Wash.—Great Northern R. R. or Northern Pacific R. R. to Portland, Ore., thence Southern Pacific lines via San Francisco, Cal., direct all the way.

St. Louis, Mo.—Illinois Central lines direct all the way.

St. Paul, Minn.—(See Minneapolis, Minn. Route).

Washington, D. C.—Southern lines direct all the way.

Passengers leaving Chicago will have the benefit of the Panama Limited over the Illinois Central Railroad, which is the train *de luxe* for New Orleans. It leaves Chicago daily, 12:30 p. m.

E. I. SMITH, Sec.-Treas.

Chairman, Committee of Arrangements,
L. V. M. A.

Dr. Donald Palmer, formerly with the 151st Field Artillery, and later with the 89th Division in Germany, has returned to the United States and has engaged in practice with Dr. W. E. Day, at Minneapolis, Minnesota. Dr. Palmer was for a number of years in the B. A. I. service.

Dr. E. L. Reed, formerly in charge of Hog Cholera Serum Manufacture with the H. K. Mulford Company, is now in charge of Hog Cholera Control Work for the State of Florida with headquarters at Chipley, Florida.

Dr. Geo. H. Berns, of Brooklyn, has fully recovered from a recent attack of pneumonia and is again enjoying his old-time vigor.



FAMOUS OLD FRENCH OPERA HOUSE, NEW ORLEANS.

"OPERA FRANCAIS DE LA NOUVELLE ORLEANS."*

Members of the A. V. M. A.! here is a splendid opportunity to witness a real genuine French Opera, fresh from the European centers of fine arts. This fall, commencing November 11th and ending February 18th, the old French Opera House in New Orleans will open its doors to the public, and according to the critics, it will be the most brilliant season of the organization.

In the Times-Picayune, under date of August 30, 1919, appears the following:

GREAT OPERATIC STARS SIGNED FOR NEW ORLEANS.

Brilliant Season is Predicted by Louis Verande,
Now in France.

"Devotees of Grand Opera in New Orleans are assured a rare treat this winter with the revival of the French Opera under the auspices of the New Orleans Grand Opera Association * * * * the sale of boxes to date has already passed the \$50,000 mark."

*In the preparation of this information, the writer received valuable data from Mr. Harry B. Loeb, New Orleans, La., music critic for the New Orleans Item.

To further show how much appreciation is being afforded, there was exhibited to the writer a cablegram from a Mrs. M. Chaffraix of New Orleans and Paris, in which she cabled \$1500 for a proscenium box, for the season, at the old French Opera House.

Louis Verande, formerly of Convent Garden, Opera Comique, Metropolitan and the Chicago Grand Opera, is the impresario. Mr. Verande is now in Europe where he has engaged the cast for the coming season. Owing to the death of Oscar Hammerstein, Mr. Verande was able to contract for stars who were under option to the New York producer. According to Associated Press reports, Hammerstein had planned to present a season of French Opera in New York in opposition to the Metropolitan and had combed Europe for stars. Practically every one under option to Hammerstein has been signed for New Orleans.

In order to furnish a vivid and artistic description of the old Opera House, I subjoin an extract from the Daily Picayune supplement of December 3, 1859:

* * * "The coup d'oeil presented by the auditorium, when viewed from the center of the parquet, was superb indeed. The house is constructed so as to afford full view of the audience from almost every point, and its gracefully curved tiers of boxes, rising one above the other, each gradually receding from the line of the other, and then filled, in a great degree, with ladies in grande toilette, presented a spectacle that was richly worth viewing * * * the whole house is painted white and the decorations of the fronts of the boxes are in gold * * * a magnificent mirror on each side of the proscenium adds greatly to the picturesque effect of the auditorium. The entrances to the house are numerous, spacious and commodious, and the crush, ladies' retiring rooms, etc., are constructed upon a scale of great elegance."

Notwithstanding the beauty and costly design of the interior, the historic old building will be renovated from orchestra pit to gallery. New scenery is being painted and new costumes will be introduced, all of which will add that much more to the splendor of the season. The exterior is not particularly prepossessing, except with regard to its size. However, it is equipped in every respect as an opera house should be, with a parquette, loges, secondes, troisiemes, quatriemes, loges grilles,¹ baignories grilles,² dress circle, boxes and foyer, all

1. Logis grilles, a screened box in a theatre.

2. Baignories grilles, a large screened box on the ground floor of a theatre.

decorated to a high degree and of the most magnificent character. Here grand opera is given as elaborately as in Paris and the companies are capable of performing opera bouffe as well as grand opera.

The program calls for the production of such favorites as *La Tosca*, *Aida*, *Les Huguenots*, *Faust*, *Il Trovatore*, *Les Bohème*, *Melisande*, *Carmen*, *La Juive* and *Lucia Pagliacci*.

Stars engaged include Edith De Lys, who will create the role of *Melisande* in *Melisande* and *Pelias*; Mlle. Gripon, who will be the *Fiora* of *L'Armour des Trois Rois*, also *Lea* of *Enfant Prodigue*; she is a dramatic soprano and was under engagement to *Hammerstein*; Mlle. Delorme, lyric soprano; *Dorothy Francis*, Mezzo; *Errole*, the famous tenor; *Milhan*, another tenor; *Henry Weldon*, basso; *Perisse*, forte tenor; Mlle. *Fanney Regia*, and a generous chorus of beautiful dancers.

It is interesting to note that when New Orleans only had a population of about 5,000 which was in the latter years of the eighteenth century, the people became ambitious and built a crude, one story wooden structure, and named it "Le Spactacle de la Rue St. Pierre." The regime was brief on account of the dilapidated condition of the building. A few years later a new theatre was erected, but was doomed to an early failure, for it soon fell under the auctioneer's hammer. In 1810, New Orleans had three theatres, and the seating capacity of the largest one, the theatre St. Philippe, was only about 700. In 1859, the present French Opera House was completed and the first performance was "William Tell." The place suddenly became popular and in 1860-61, *Adelina Patti*, then the 18 year old prima-donna, charmed her audiences in "Il Trovatore" and "Les Huguenots," both of which will be produced this season. From 1859 to the present time, the doors of the French Opera in New Orleans, have been open with the exception of interruptions during the Civil War and the late European conflict. It was New Orleans that first introduced French and Italian Opera into America and the Crescent City gave many performers such applause that they later became famous, both at home and abroad.

Both grand opera and opera bouffe existed in New Orleans long before it was established anywhere else in America, and the opera is one of the features which distinguishes the city.

It would render it remarkable among American cities even if it had no other unique feature.

Only five blocks from the heart of Canal Street, on the corner of Toulouse and Bourbon Streets, stands the old historic French Opera House. It is designed and constructed along simple and plain lines of the old Italian Renaissance style of architecture and has a seating capacity of 2800 people. The building is one of the best appointed opera houses in the world, and within its magnificent interior, bathed in an atmosphere of celestial environment, many a real connoisseur has received an inspiration and acquired, quite above the average, an operatic education at a very reasonable expenditure.

A number of the customs of the old Theatre d'Orleans were modified and transmitted to the present old edifice; notably, in the antebellum days full evening dress was required of the audience, but now only evening dress is tolerated in the boxes. The opening of the opera is the opening of the social season, particularly in New Orleans, and it is sincerely hoped the wives and daughters of the members of the A. V. M. A. will make this occasion the climax of their social season and come to the Convention City in full force.

E. I. SMITH,

PARTIAL LIST OF PAPERS AND AUTHORS FOR THE PROGRAM OF THE NEW ORLEANS MEETING.

Up to the time of going to press, THE JOURNAL has not received the completed program of the New Orleans meeting. However, the following is a list of a number of papers and authors in different Sections.

SECTION ON SANITARY SCIENCE AND POLICE.

Symposium on Infectious Equine Anemia (Swamp Fever).

Experimental Transmission of Swamp Fever, or Infectious Anemia, by Means of Insects—Prof. John W. Scott, Laramie, Wyoming.

Swamp Fever—Dr. Seymour Hadwen, Ottawa, Canada.

A Comparative Study of the Long Bones in Infectious Equine Anemia and Other Conditions—Dr. Lewis H. Wright, Reno, Nevada.

Discussion:

Opened by Dr. C. P. Fitch, St. Paul, Minn., who will touch upon the geographical distribution, as well as certain pathological aspects of the disease.

Swamp Fever in the North—Dr. A. F. Schalk, Agricultural College, N. D.

Swamp Fever in the South—Dr. E. M. Ranck, Agricultural College, Miss.

Session Devoted to Diseases of the South.

Parasitic Diseases in Their Relation to the Live Stock Industry of the Southern United States—Drs. B. H. Ransom and M. C. Hall, Washington, D. C.

Poisonous Plants of the South—Dr. E. D. King, Mobile, Ala.

Deficiency Diseases of the South—Dr. C. A. Cary, Auburn, Ala.

Tick Eradication in the South—Dr. E. I. Smith, Baton Rouge, La.

Strongylidosis in Horses and Mules—Dr. P. J. Orchard, Baton Rouge, La.

Symposium on Diseases of Cattle.

White Scours or Calf Scours—Drs. W. L. Williams, W. A. Hagan, and C. M. Carpenter, Ithaca, N. Y.

Malignant Catarrhal Fever—Dr. T. E. Munce, Harrisburg, Penn.

Additional Observations on Tuberculin Testing and Retesting—Dr. H. W. Turner, New Hope, Penn.

Some Carriers of Anthrax Infection—Dr. Harry Morris, Baton Rouge, La.

Session Devoted to Topics of Interest to B. A. I. Veterinarians.

Retrospection and Fraternity from the Standpoint of a Former Employee of the Bureau of Animal Industry—Dr. V. A. Moore, Ithaca, N. Y.

Paper—Dr. John R. Mohler, Washington, D. C.

Tuberculosis Eradication—Dr. Jno. A. Kiernan, Washington, D. C.

Meat Inspection and Its Value as a Safeguard to the Public Health—Dr. R. W. Tuck, New Orleans, La.

The Sanitary Production and Handling of Milk—Dr. F. J. Cambon, New Orleans, La.

Transmission of Diseases by Insects—Mr. F. C. Bishopp, Dallas, Texas.

Paper (Title to be announced)—Drs. Seymour Hadwen, Ottawa, Canada and B. H. Ransom, Washington, D. C.

SECTION ON PRACTICE.

Intussusception of Intestines—Dr. J. N. Frost, Ithaca, N. Y.

Cæsarian Section in the Sow—Dr. J. N. Gould, Worthington, Minn.

Surgical Phases of Army Veterinary Work in France—Major George B. McKillip, Chicago, Ill.

Bang Disease, or Abortion Disease; Its Handling by the Practitioner—Dr. J. F. Devine, Goshen, N. Y.

Impaction in the Horse—Dr. H. A. Trippeer, Walla Walla, Wash.

Sheep Practice—Dr. E. T. Baker, Moscow, Idaho.

Heredity as Expressed by Our Stallion Registration Laws—Dr. W. H. Welch, Lexington, Ill.

Economic Production of Hogs in the South—Prof. Dan T. Gray, Raleigh, N. C.

The Purpose and Scope of Extension Veterinary Work—Dr. L. C. Kigin, Lafayette, Ind.

One of the General Sessions will be given over to the Army Veterinary Service, and the subjects presented will include

The Army Veterinary Service in the United States—Col. C. J. Marshall.

The Veterinary Service in the A. E. F.—Col. H. E. Bemis.

The British Army Veterinary Service—A Ranking Veterinarian of the Canadian Veterinary Service.

In addition to the above, there will be the business of the General Sessions, etc., all of which will appear on the completed program.

RECORDS OF SERVICE, ETC. WANTED BY SECRETARY MAYO.

It is probable that most members of the American Veterinary Medical Association do not know that the records of the individual members are kept upon a loose-leaf system. This system provides for data with reference to the life and work of

the individual as well as his preliminary and professional training.

Among other items is "position held". The secretary is very anxious to get the military records of all members of the A. V. M. A., so that they can be inserted on their records in the Association. At the present this may not seem important to most members who have been, or are, in the service, but as years pass it will become of much more interest. I hope that every member of the Association who was in the service, will send a brief statement of that service with the rank held.

There are also a number of members who have held important state or federal positions. These should also be sent in for the A. V. M. A. records. N. S. MAYO.

Dr. A. D. Hubbel is Live Stock Inspector for San Bernardino County, California. This county covers more than twenty thousand square miles and unquestionably keeps Dr. Hubbel busy covering this territory.

Major James A. Campbell, of the Canadian Army, has recently returned from Siberia and has been discharged from the army, resuming his practice at Toronto.

Dr. Chas. H. Jewell has returned from France and at present is on duty in the office of the Surgeon General, Veterinary Division, Washington, D. C.

Capt. R. A. Kelser is now at the Veterinary Laboratory of the U. S. Army at Philadelphia, Pa.

Dr. F. M. McConnell is now practicing at Litchfield, Mich. His previous address was Cold Water, Mich.

Dr. C. D. Bailey has moved from Kalona, Iowa, to St. Elmo, Ill.

Dr. Arthur W. Combs is now located at East Orange, N. J.

OTHER ASSOCIATIONS.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION.

TENTATIVE PROGRAM OF CHICAGO MEETING, 1919.

Monday, December 1, 1919, 10:00 A. M.

Roll Call.

Address of Welcome. — Hon. Frank O. Lowden, Governor of Illinois.

Response. — John R. Mohler, Washington, D. C., Chief, Bureau of Animal Industry.

Reading of Minutes.

President's Address. — George W. Dunphy, Michigan.

Report of Secretary-Treasurer.

Report of Committee on Legislation. — M. C. Cohen, Kentucky.

Report of Committee on Publication. — D. M. Campbell, Illinois.

Report of Committee on Grievances. — T. E. Munce, Pennsylvania.

Report of Committee on Tick Eradication. — E. Pegram Flower, Louisiana.

Monday, December 1, 1919, 2:00 P. M.

Present Status of the Live Stock Industry. — H. R. Smith, Illinois, Secretary L. S. Com. Association.

Report of Progress in Tuberculosis Control. — J. A. Kiernan, Washington, D. C., in Charge Tuberculosis Control and Eradication, B. A. I.

Tuberculosis and the Dairy Industry. — D. D. Akin, Michigan, President American Holstein-Friesian Association.

Practical Application of the Accredited Herd Plan from the Breeders' Viewpoint. — George Martin, Illinois, Field Man for the Breeders' Gazette.

Experiences of Those Who Have Taken the First Step in Tuberculosis Control or Eradication. — (Talks open to the floor, each discussion limited to ten minutes.)

Discussion.

Tuesday, December 2, 1919, 10:00 A. M.

Report of Committee on Hog Cholera. — A. L. Hirleman, Georgia.

Report of Progress in Hog Cholera Control. — M. Dorset, Washington, D. C. Chief, Biochemic Division, B. A. I.

Differential Diagnosis of Infectious Diseases of Swine. — (Papers by A. T. Kinsley, Missouri, and three others, to be selected and subjects assigned by Dr. Kinsley.)

Tuesday, December 2, 1919, 2:00 P. M.

Report of Committee on Contagious Abortion. — Ward Giltner, Michigan. Professor of Bacteriology, Michigan Agricultural College.

Subject to be Selected. — E. C. Schroeder, Maryland. In charge, Bureau of Animal Industry Experiment Station.

Discussion. — W. L. Williams, New York, New York State Veterinary College. E. T. Hallman, Michigan, Pathologist, Michigan Agricultural College.

Practical Methods of Handling Herds Affected with Abortion Disease. — John F. DeVine, New York, Editor, Department of Cattle Practice, American Journal of Veterinary Medicine.

Discussion.

Wednesday, December 3, 1919, 10:00 A. M.

Report of Committee on Diseases. — L. Van Es, Nebraska, Research Department, Nebraska Agricultural Experiment Station.

Report of Committee on Special Skin Diseases. — B. H. Ransom, Washington, D. C., Chief, Zoological Division, Bureau of Animal Industry.

Subject to be Selected. — Adolph Eichhorn, New York, Veterinary Director, Lederle Laboratories.

The Sheep Industry. — Frank Hegenbarth, Utah, President, National Wool Growers' Association.

Subject to be Selected. — F. R. Marshall, Washington, D. C., Animal Husbandry Division, Bureau of Animal Industry.

Hemorrhagic Septicemia in Sheep. — I. E. Newsome, Colorado, Professor of Pathology, Colorado Agricultural College.

Sheep Parasitisms. — Maurice C. Hall, Washington, D. C., Senior Zoologist, Bureau of Animal Industry.

Wednesday, December 3, 1919, 2:00 P. M.

Sanitation and Livestock Transportation.—J. G. Rutherford,
Canada, Dominion Railway Commissioner.

BUSINESS SESSION.

COMMITTEE REPORTS.

Finance. — D. F. Luckey, Missouri.

Credentials. — P. E. Bahsen, Georgia.

Resolutions. — J. I. Gibson, Illinois.

Delayed Reports.

Unfinished Business.

New Business.

Election of Officers.

Appointment of Committees.

Adjournment.



TEXAS STATE VETERINARY ASSOCIATION.

Group of Members and Visitors in Front of Francis Hall, Texas A. & M. College.



A GROUP OF A. V. M. A. MEMBERS, AT PEARL RIVER, N. Y.

NEW YORK STATE VETERINARY MEDICAL ASSOCIATION.

The New York State Veterinary Medical Association which held its convention July 23rd to July 25th, in Brooklyn, included in the program a trip to Pearl River, N. Y., to visit the Lederle Antitoxin Laboratories located there. About forty

members participated in this outing, which according to the consensus of opinion was highly profitable to everyone present.

Demonstrations were given showing the preparation of the various biological products used by the veterinarians, a keen interest being especially manifested in the production of the clear anti-hog cholera serum which was demonstrated in detail from the beginning of the preparation until the finished product is obtained.

The members of the Association came and departed in a special car. The ladies who accompanied the party were treated to an automobile ride along the picturesque Hudson Drive. All departed having spent a profitable day. A vote of thanks was extended to the Laboratories for the pleasant and profitable time they had enjoyed through their courtesy.

SASKATCHEWAN VETERINARY ASSOCIATION.

The Journal has obtained the following report from a recent issue of the *Regina Daily Post*.

The annual summer school of the Saskatchewan Veterinary Association was held at the University of Saskatchewan.

Dr. Charles Head and Dr. M. P. McClelland were appointed on the executive of the association. The other officers were:

Dr. J. S. Gibson, Govan, President;

Dr. J. M. Fawcett, Saskatoon, Vice-President;

Dr. R. G. Chasmar, Hanley, Registrar.

EXECUTIVE MEMBERS:

Dr. Charles Head, Regina;

Dr. M. P. McClelland, Regina;

Dr. H. Richards, Indian Head;

Dr. W. Reed, Balcarres.

The clinic was in charge of Major J. H. Blattenberg, United States Veterinary Corps, Lima, Ohio, who performed operations and lectured daily. Major Blattenberg spent two years in France, being connected with the Allied armies before the United States entered the war.

Dr. Elliot of Saskatoon also addressed the school; and the session was closed with brief addresses by eight members of the association who recently returned from France.

On his return from the Canadian Northwest Major Blattenberg reported an unusually pleasant meeting, and stated that

they were a wide awake and up-to-date bunch in that section of the world, and that he had enjoyed his trip up there immensely.

CENTRAL CANADA VETERINARY ASSOCIATION.

The semi-annual meeting of this association was held in Ottawa on 13th and 14th August.

The members met at Howick Hall in the Exhibition Grounds at 2 p. m., on 13th August, and motored out to the Ottawa Dairy Farm, when Dr. W. L. Williams, of Ithaca, opened the clinic. Practical demonstrations of sterility in cattle were given, and operations were performed on suitable subjects.

Mr. John Bingham, Managing Director of the Ottawa Dairy Company, entertained the members and visitors in his usual pleasing manner, refreshments being served on the lawn.

The evening session convened in Howick Hall, Dr. George Hilton, the President, being in the chair.

Dr. J. W. Adams, of the University of Pennsylvania, gave an excellent address full of practical points on surgery, restraint of animals, and anæsthesia, which was very much appreciated.

The clinic was resumed at 10 a. m., on the 14th August, with Drs. Adams and Fowler operating upon varied cases, consisting principally of fistulæ, hernias and tumors. Dr. Williams also removed a tumor from the cervix of the os uteri of a cow. Much interest was manifested by the members in the operations, which were very ably performed.

In the evening the President was again in the chair, and Dr. W. L. Williams gave a very instructive address on contagious abortion.

The clinic and the meeting were well attended, among the many present being Controller Kent, of Ottawa, Dr. J. G. Rutherford, Railway Commissioner of Canada, Dr. F. Torrance, Veterinary Director-General, Dr. C. D. McGilvray, Principal of the Ontario Veterinary College, Professors Daubigny, Genereaux and Dauth, of Laval, and the Etienne Brothers, of Montreal.

During the business sessions the members discussed the very unsatisfactory status of the profession in Ontario. This was considered to be due largely to the fact that no satisfactory legislation has been passed to prevent unqualified men from practicing.

Dr. George Hilton, A. R. Metcalfe and C. M. Higginson were appointed a committee to take active measures with a view to having suitable legislation passed.

Hon. S. F. Tolmie, V. S., the recently appointed Minister of Agriculture, expressed through the President his regrets at not being able to be present owing to his absence from the city.

The following resolutions were passed unanimously:

Whereas the Prime Minister of Canada has selected Dr. S. F. Tolmie as Minister of Agriculture and

Whereas Dr. Tolmie is a leading member of the veterinary profession and

Whereas he is eminently qualified for the position by training and experience in all branches of scientific agriculture,

Therefore be it resolved that this Association hereby record its appreciation of the selection of Dr. Tolmie for this important office and convey to him its best wishes.

Whereas Dr. J. G. Rutherford, C. M. G., has been appointed a member of the Board of Railway Commissioners for Canada and

Whereas Dr. Rutherford has been a faithful member of this Association and instrumental in promoting its best interests,

Therefore be it resolved that this Association convey to Dr. Rutherford its appreciation and extend its best wishes for his future success in larger fields of national service.

Whereas the Minister of Agriculture of Ontario has announced that the Ontario Veterinary College has adopted a definite standard of Matriculation and the granting of the Degree of Bachelor of Veterinary Science by the University of Toronto and

Whereas the Association is convinced that this will insure a higher standard of veterinary qualification,

Therefore be it resolved that this Association avail itself of this opportunity to convey to the Hon. Geo. S. Henry, the Minister of Agriculture, the assurance of its appreciation of his action in arranging for a higher standard of veterinary education and qualification.

Whereas the live stock interests are a valuable factor in the economic development of the Province of Ontario, creating national prosperity and

Whereas the live stock interests are worthy of every effort being put forth to preserve them from economic losses and

Whereas the health of live stock must be preserved and skilled veterinary services provided for the prevention of losses from preventable diseases and the proper treatment of disease and

Whereas this can best be assured by qualified and properly trained veterinarians and

Whereas the registration of veterinary surgeons has been adopted and enacted by law in the other provinces of Canada as a means of maintaining a good standard of veterinary service and prohibiting quackery and

Whereas the Province of Ontario has not enacted such legislation as would safeguard the live stock interests against quackery and

Whereas the Province of Ontario is thus disparaged in comparison with the other provinces of Canada in not having adequate legislation to maintain a high standard of veterinary qualification for practice in Ontario,

Therefore be it resolved that this Association hereby request the Government of Ontario to enact legislation requiring the registration of veterinary surgeons for practice, similar to the laws now existing in the other provinces of Canada.

Whereas the Province of Ontario is maintaining the Ontario Veterinary College as an educational institution for the purpose of enabling young men to obtain scientific knowledge of veterinary science and

Whereas the course of instruction and attendance extends for a period of four academic years leading to the Degree of Bachelor of Veterinary Science conferred by the University of Toronto and

Whereas there exists in the Province of Ontario certain privately owned concerns purporting to give a course of training in veterinary science by mail, and in the short period of a few weeks' correspondence to grant so-called Diplomas and Degrees in Veterinary Science to all and sundry on payment of a fee, and

Whereas such institutions are not permitted to exist in any other province in Canada,

Therefore be it resolved that this Association express its strong disapproval of any institutions other than recognized

Universities and accredited Veterinary Colleges giving courses granting so-called Diplomas and Degrees.

GEORGE HILTON.

ASSOCIATION OF B. A. I. VETERINARIANS.

(Metropolitan Division.)

At a meeting of the Metropolitan Division of the Bureau of Animal Industry veterinarians, New York City, on August 25, 1919, the following resolution was presented and unanimously adopted:

"This association having learned with deep satisfaction the decision of our Chief, Dr. John R. Mohler, to continue his services with the Bureau of Animal Industry,

"Resolved that we congratulate our country, the Secretary of Agriculture, and the veterinary profession of America on the spirit of sacrifice and unselfishness shown by him in this decision and that we recognize his splendid services, masterly direction of the Bureau, and great knowledge of the conservation of animal industry to be a great asset to our country during the present period of reconstruction.

"Resolved also that copies of this resolution be sent to the Chief of the Bureau and the Secretary of Agriculture."

EDWARD L. SANDER, *Secretary.*

TICK ERADICATION IN THE SOUTH.

Status of cattle dipping for the month of August, 1919, in the following States:

Alabama	1,016,197
Arkansas	609,748
Florida	223,013
Georgia	452,110
Louisiana	1,245,767
Mississippi	245,572
North Carolina	7,355
Oklahoma	509,029
South Carolina	148,072
Texas (North)	1,476,144
Texas (South)	553,496

COMMUNICATIONS

A CORRECTION.

In the last line of paragraph three in the communication on "Fetish Worship" by Dr. Thos. B. Rogers, in the September Journal, the term "Plain Geometry" should, necessarily, have read Plane Geometry. We offer the Doctor an apology for the oversight, and will do what we can to persuade our proof-reader to accept the blame for the error.—Ed.

DR. BLATTENBERG DESIRES CORRESPONDENCE.

Editor, Journal:

Quite frequently I receive inquiry from veterinarians who are having trouble with the roaring operation, the chief complaint being an ossification of the larynx. I will be better able to explain the cause of this condition with more detailed information as to methods used and after care.

The idea has occurred to ask the veterinarians, both those having trouble and those having success, to write me a detailed description of their operation. This should include, preparation of the animal, restraint, anæsthesia, technique, kind of tracheotomy tube used and whether inserted in the opening into the larynx or in the trachea, whether one or both ventricles are stripped of mucosa and after care for a period of one month. What per cent of operations have not been successful?

These letters will give a chance to compare methods and will not be published, but, from these letters an article will be formulated for publication attempting to explain the cause of this condition and suggesting plans to avoid it.

This is simply a suggestion, if carried out will require some work but the results may be well worth the effort. Letters should be addressed to me at my office.

JOHN H. BLATTENBERG,
130 South Union Street, Lima, Ohio.

Dr. L. I. Hines has moved from Holstein, Nebr., to Hastings, Nebr.

NECROLOGICAL.

DR. F. A. REICHMON.

Dr. F. A. Reichmon, Geddes, South Dakota, died from anthrax last August. At the time of going to press *The Journal* has no further information concerning Dr. Reichmon's death. However, he was a graduate of the Chicago Veterinary College in 1910, and joined the A. V. M. A. in 1912.

DR. W. O. DEBOLD.

Dr. W. O. Debold, a member of the A. V. M. A., and an inspector in the Bureau of Animal Industry in Chicago, was killed in an automobile accident in Chicago about August 10th.

Dr. Debold was a graduate of the Cincinnati Veterinary College in 1913, and joined the A. V. M. A. in 1918.

DR. WILLIAM J. MORGAN.

Dr. William J. Morgan of Seaton, Illinois, died July 15th, 1919. Dr. Morgan was a graduate of the Colorado Agricultural College and of the Chicago Veterinary College. He also taught *Materia Medica* for a time in the veterinary school at Fort Collins, Colorado.

Dr. Morgan joined the A. V. M. A. in 1912 and was also a member of the Illinois Veterinary Association. He was a leader in his community in all lines of progress and was one of the prominent veterinary practitioners of Illinois.

DR. EDWARD C. ROSS.

Dr. Edward C. Ross, D. V. S., graduate of the American Veterinary College, class '84, passed away at New Haven, Conn., August, 1919. A long and distressing illness from carcinoma of the intestines preceded his death.

Ill health had led him to retire from active practice some years before. He was unmarried.

Masonic burial services were conducted in New Haven August 17th, after which at his request his body was cremated at Pleasant Valley, New York.

He was on the honor roll of membership of the A. V. M. A. and still continued actively interested in the Connecticut State Veterinary Medical Association.

DR. CHAS. R. TREADWAY.

The Journal has just received notice of the death of Dr. Chas. R. Treadway, Kansas City, Mo., formerly of Canton, Mo.

Dr. Treadway was a graduate of the Kansas City Veterinary College in the year 1905, and joined the A. V. M. A. in 1909.

ROYAL COMMISSIONER J. G. RUTHERFORD TO PROBE HORSE RACING IN CANADA.

Dr. J. G. Rutherford, C. M. G., member of the Dominion Board of Railway Commissioners, has been appointed by the Federal Government, of Canada, a Royal Commissioner to conduct an inquiry into conditions pertaining to running race meetings and betting in connection therewith in Canada. His investigation will cover a wide field, and the evidence which he adduces and his report will furnish a base for legislation by the Canadian parliament. In this important appointment THE JOURNAL desires to congratulate not only Dr. Rutherford himself, but the Dominion Government and the veterinary profession as well.

Dr. R. J. W. Briggs, formerly in charge of hog cholera work in Louisiana, has been transferred to take charge of the same work in South Dakota, with official station at Brookings.

1st Lieut. D. D. Strolcy, Class '17 of the New York State Veterinary College, New York University, has resigned from the regular Army Veterinary Service to enter private practice.

Dr. H. N. Guilfoyle, engaged in the work of tick eradication in Louisiana, has been transferred to similar work in Texas.

MISCELLANEOUS.

TWO MOST EXCELLENT ARTICLES.

In the Army Pictorial Section of *The Come Back*, of July 16th, is a most excellent illustrated article on The Veterinary Corps, U. S. Army, which gives a world of information on one of the newest organizations to be formed as the result of the late war, and of whose achievements in the Medical Department the profession may feel justly proud. The majority of those who were not actively connected with the Service can have little conception of the monumental effort it required to organize our great Army Veterinary Corps. The article in question discusses, interestingly, the various branches of the work, and closes with a statement, under the subhead, Benefit by Training, regarding the field of service for applicants which the enlisted Veterinary Corps offers. Members of the profession to whom a military life in the Veterinary Service appeals, should obtain a copy of this particular issue of *The Come Back*, and read the entire article.

The other article referred to, also well illustrated, is "Making the Army Safe for the Horse," by Gerald E. Griffin, Lieut. Col. V. C., Director during the War, of the Veterinary Corps Training School, Camp Lee, Va., and published in the September number of *The National Humane Review*, Albany, N. Y. The article devotes considerable of its space to the activities of the Camp Lee Training school, and lays special stress on the "Humanitarian Influence" exerted. "It is deemed only fair at this point," says Col. Griffin, "to pay tribute to the influence for good exerted on the teaching staff of the Veterinary Corps Training School at Camp Lee, by the humane sentiments of the American Humane Association, the Red Star Animal Relief, the Animal Rescue League, and kindred organizations, and to pay special tribute to that broad-minded and warm-hearted lover of our domestic animals, Mrs. Huntington Smith, of the Animal Rescue League, Boston, Mass., who by her interest and faith in the work of the Veterinary Corps has erected unto herself a monument, in the hearts of those who served at the school at Camp Lee, that cannot die."

To the profession we also commend, highly, the perusal of this splendid article by Col. Griffin.

THE EQUINE HERO.

On a great city's street, on a hot summer day,
With the pavement below fairly melted,
A thin looking nag wearily trudged on his way,
As with every "Gid dap" he was belted.

"Hot weather's the stuff," the owner remarked,
"The force that will roll in the dollars;"
And the nag struggled on from daylight till dark,
A gathering sores under the collars.

The hot summer sun swooped down on his brain,
Humidity gripped at his throat;
A massive umbrella had he with the rein,
Most cool and serene was the bloke.

The thirst of the nag was prodigious and aye
He felt quite akin to a goner,
He needed more drinks than they gave him that day,
While the driver slaked his on the corner.

With a slash of the whip of the knight o'the truck,
And a head hanging low from the drouth;
Mid roar of the street and swirl of the muck,
He is jerked to a germ laden trough.

Once more the nag's urged up the sizzling street;
Once more does the whip take its slice;
The roadway's a baking and burning his feet
And holding the wheels like a vise.

With sweat gushing forth and a heaving of chest,
A cool, shady park does he skirt;
He understands not the great silent jest:
The "keep off the grass" on the turf.

Long after dusk the nag finished his haul;
At last out of strife hot and dusty;
Back to the sweltering, stifling stall,
Back to the food that is musty.

Munching, he finds it a wearisome task;
His bones how they ache and how sore;
In the midst of the air like a hot furnace blast,
Seeks rest on a hard wooden floor.

Next morning at dawn he is yanked out again,
Strapped to a big, crushing load;
Till high noon he toiled, this servant of men,
Urged on by the merciless goad.

The earth seemed to tremble — a desperate lug,
The whip had been swung for its thrust
But a martyr had made his last faithful tug,
When a poor stack of bones bit the dust.

EDWARD L. SANDER, *D. V. S.*

AN EXCELLENT LETTER BY RESIDENT-SECRETARY A. D. KNOWLES OF MONTANA.

To the Veterinarians of Montana:

The A. V. M. A. will convene in New Orleans, Louisiana, November 17-21, 1919, inclusive.

This will be the second time the association will have met in the South, and for those who may be fortunate enough to attend it will be a most inspiring event. The great big hearted hospitality of the southern people will be exercised to its capacity and every person there will be made to feel the effect of their good will.

This will mark the beginning of the reconstruction of veterinary science, following the world war, and as the A. V. M. A. has always been a leader in advancing the cause of the veterinary profession on this continent, so will she at this convention, no doubt, establish regulations and principles which will be recognized by veterinarians through all future time.

President Moore and Secretary Mayo have set about to make the New Orleans meeting the most helpful that has ever been held. The veterinarians of the Southeastern States Veterinary Medical association and the Louisiana association have organized and expect to be able to furnish better entertainment for all who attend than they ever experienced before.

Editor Dalrymple requests that original articles for publication be forwarded to him, as well as case reports and news items; the Journal of the A. V. M. A. is for the entire veterinary profession and Dr. Dalrymple requests the cooperation of all.

I will be glad to furnish application blanks for membership in the A. V. M. A., and solicit applications.

Yours very truly,

A. D. KNOWLES, Resident-Secretary.

DR. WINCHESTER NEVER OVERLOOKS THE HEALTH OF HIS COMMUNITY.

WARNING AGAINST TUBERCULOUS MILK.

Dr. J. F. Winchester, inspector of slaughtering and cattle, calls the following article to the attention of the public of Lawrence in support of his contention as set forth in the article, "A Common and Public Nuisance — The Tubercular Cow."

The following extracts appeared in the report of the Veterinary director General (F. Torrance, B. A., D. V. S.) for the department of agriculture, Canada, in the issue of March 31st, 1918.

(Printed by order of Parliament.)

The importance of this work, the testing of cattle for Tuberculosis, to the health of a community can hardly be over-estimated, especially to the welfare of the child population. It was found by our tests that some herds were supplying milk to be consumed in the raw unpasteurized state, when most every cow in the herd was diseased. This milk must have been highly dangerous for the children drinking it, yet the parents were probably quite satisfied if its appearance and taste were all right.

Experiments have proved that young pigs fed on tuberculous milk become tuberculous to the extent of 80 per cent if they

receive only two or three feeds of it. When fed continuously on it for a month, 100 per cent became infected.

There is no reason to believe that children are not equally susceptible to the effect of consuming tuberculous milk. The results are not so evident as in the case of pigs, but far more disastrous to the human race. Much human tuberculosis comes from drinking tuberculous milk, and every effort should be made to prevent it by putting the tuberculous cow out of business.

—*Lawrence (Mass.) Daily Eagle.*

INTERESTING CARD FROM DR. G. A. ROBERTS, SAO PAULO, BRAZIL.

Under date of August 1st, Dr. G. A. Roberts sends Secretary Mayo a card of interesting information from his new location at Sao Paulo, Brazil. Among other things, Dr. Roberts says: "This is a most wonderful country in beauty, novelty, and resources. I would not have missed it for anything, but I cannot give you much information yet as to my duties or prevalent diseases. However, they are putting up some beautiful buildings for Institute Veterinaria," which Dr. Roberts very graphically describes, and which suggests that that section of the Continent is alive to the importance of good men and good equipment in its effort at research along the line of animal pathology. We are sure that all Journal friends join with us in wishing Dr. Roberts every success in his new home and work.

Dr. Edward Lapple has received his discharge from the army and is now located at Sioux City, Iowa.

Dr. Wilbur Pierret is now with the B. A. I. at Denver, Colo. Dr. Pierret was formerly stationed at St. Joseph, Mo.

Dr. H. C. Berger has recently been transferred in the work of Tick Eradication from Thibadoux, La., to Granbury, Texas.

Among the recent subscribers to the JOURNAL, is Senor D. José Coya, Chief Veterinarian to His Majesty, the King of Spain.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n)

W. H. DALRYMPLE, Editor.

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V. A. MOORE, President, Ithaca, N. Y.

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NOVEMBER, 1919

No. 2

DR. SIMON F. TOLMIE, M. P.

It is always a source of very great pleasure to those who are endeavoring to raise the status of the profession when one of its members receives due recognition at the hands of the public, and especially of the government of the country to which he belongs. Dr. Simon Fraser Tolmie, of Victoria, British Columbia, a worthy member of the American Veterinary Medical Association, and who represents the City of Victoria in the Canadian House of Commons, has recently been appointed Minister of Agriculture for the Dominion of Canada, which, we understand, is the first time a veterinarian has occupied a Cabinet position in the Dominion. Dr. Tolmie's appointment to the portfolio of agriculture has met with general approbation throughout the Dominion, and his many friends south of the international boundary will join with Canadian agriculturists and veterinarians in hearty congratulations.

Through our Canadian confrere, Dr. J. G. Rutherford, we are informed that the recipient of this honor has long been associated with the leading organizations working for the advancement of the live stock industry in Canada and the improvement of the veterinary profession. In these two fields of effort

he has made many intimate friends all over America who will view his appointment as a well-merited promotion, and an opportunity for him to still further assist and guide the agricultural industry. As chief Inspector for the Health of Animals Branch in British Columbia, and as President of the British Columbia Veterinary Association, Dr. Tolmie has been in close touch with farming and with live stock needs from a health point of view. However, he has served in an even larger field, for at the time of his appointment he was President of the Western Canada Live Stock Union, the Canadian National Live Stock Council, and the Holstein-Friesian Association of Canada.

Dr. Tolmie's efforts in a public way, combined with actual farm experience, he being owner of "Braefoot Farm," near Victoria, B. C., where he makes his home, should equip him admirably for the task in hand. In fact it is stated that no Minister has accepted a Dominion portfolio with a broader knowledge of the industry.

Dr. Tolmie is a comparatively young man, being born, of British parentage, at Victoria, B. C., January 25 1867; he was educated at the Victoria High School; and received his degree in veterinary medicine and surgery from the Ontario Veterinary College.

It is distinctly refreshing to be able to record such splendid recognition of one of our members, which ought to aid in enlightening the public as to the worthiness of the profession to occupy exalted positions connected with governmental affairs.

THE JOURNAL desires to extend to Dr. Tolmie its heartiest congratulations and best wishes in his new sphere of usefulness, which it feels sure will result beneficially to the agriculture of Canada and to the veterinary profession, of which he is an honored member.

So far as we know, Dr. Tolmie is the first member of the veterinary profession to hold a Cabinet position, not only in Canada, but in any country.

UNFORTUNATE.

The following is a quotation from an editorial which appeared in *The Shorthorn World*, of August 25th:

"There are many able and straightforward veterinarians, but, unfortunately, there are also very many

who should not have a license to practice. The hardest fight that stockmen have at present is not with 'T. B.,' but with incompetent, irresponsible and vicious 'vets.' The various breed associations owe it to themselves and their membership to get in close coöperation with federal and state authorities to the end that the brood of ignorant and domineering members of the worthy profession may be curbed in their propensity to prey upon an industry that is at the very foundation of the country's prosperity."

There are always two sides to a question, and we are not familiar with the individual details which brought forth the above arraignment, although, from another part of the same editorial, it was evidently in connection with tuberculin testing in the accredited herd work. It is unfortunate, however, if some members of the profession should merit such severe criticism; and also unfortunate that the criticism should gain such publicity through the pages of an important breed publication, as it is sure to reflect, more or less, on the profession as a whole, although the editor evidently did not mean it that way, as he further states, that, "there is no country where there is a larger proportion of absolutely able and unbuyable veterinarians."

We are unable to discuss the merits or demerits of the instance, or instances, alluded to in the editorial cited, as we do not have the facts before us. However, we are not living in millennial days, of course, and until that time arrives, it is useless to expect perfection, ethically speaking, even among members of the veterinary profession, and which we have no doubt applies to other professions. Human nature is the same the world over, and the proverbial black sheep is to be found in every flock; and while this is unfortunate, it, nevertheless, seems to be true. However, the "shady act" will generally gain much wider publicity than that which is creditable. The former is often seized upon by the press as "good stuff," and classed as "sensational;" while the good that a man does is frequently passed over without comment because it is expected of him. Hence the good work accomplished by many members in trying to raise the standard of the profession in the eyes of the public may be more than counterbalanced by the unprofessional act of a single member.

We have just referred, in our previous article, to the splendid recognition given the veterinary profession through the promo-

tion of one of our members in the person of Dr. Tolmie, and the tendency it will have in elevating its status. Still the standing of the profession should not have to depend upon special promotion, such as Dr. Tolmie has received, but every member, no matter how obscure his position in life may be, is capable, if he will, of doing his little "push" in the upward direction.

As to the facts which called forth the editorial alluded to, we repeat, we are not informed; there may be discrepancies on both sides. At the same time it is unfortunate if any members of the profession are to be found whose acts are sufficient to call forth such an arraignment of them as that given in the issue of *The Shorthorn World* referred to. It is one of the most potent means of staying the progress that is so much to be desired. It should be remembered that it is the man who makes his profession, rather than the profession that makes the man.

THE LAST APPEAL.

The events of the previous meetings of the A. V. M. A. have, each time, been heralded with unusual enthusiasm, with the hope that each anniversary might prove its superiority over all preceding ones. This spirit of progression is human nature and, did we not proudly possess it, we might still be depending altogether on good fortune to cure the ails of man and beast.

This year the Association is stronger and more zealous than ever before in its history, to develop the welfare of the profession on a basis of equity to all. This is evidenced through the increased membership within the last two years. Veterinarians who are ambitious to succeed on merit have commenced to recognize the strict necessity of a systematic, harmonious organization built upon great democratic principles, sound and safe, for the profession and its clientele. Every veterinarian, whether he be employed in practice, public service, educationally, or commercially, should cultivate the principles, which became so deeply inculcated into the minds of the designers of the Declaration of Independence; notably, for a new nation, born for the common good of all, likewise a greater A. V. M. A. for the mutual good of every member, but not forgetful of the underlying fundamental doctrine, that we can only prosper and expand in proportion to our usefulness to the cause to which we are devoted.

When we think back to June, 1863, and use our vivid imaginations to compare what was available to call upon for the first meeting of our Association, it is almost beyond our comprehension to realize the advancement which has since been made. It is all the result of a higher standard—quality, quantity, equipment and knowledge, properly utilized to serve a definite purpose. Our purpose is to be as resourceful as possible, but unless we frequently meet together to exchange ideas and discuss our problems from a national standpoint, we, as individuals, are liable to suffer mental atrophy and become so eccentric and self devoted as to be unable to appreciate how our brothers live. Often one imagines he is suffering unusual adversity, but such illusions are apt to sink into utter insignificance when measured up alongside the difficulties entertained by the other fellow.

This fall, November 17-21st, will be an opportunity, *par excellence*, to promote a kindlier feeling of brotherly love and develop the Association beyond our fondest hopes. Every member of the A. V. M. A. is a stockholder in THE JOURNAL and its equipment, and should feel that he is an important unit toward contributing useful matter for each month's publication. THE JOURNAL is the official organ of the Association, owned and controlled accordingly, and we should make a special effort to see that it reaches the office of every veterinarian in the United States, Canada, and as many as possible abroad. The policy of THE JOURNAL must be kept up to its usual high standard, absolutely impartial, open for the dissemination of the best reliable, authentic information, and above all permanently located, with a decided business policy back of it.

We believe that never before in the history of the world will there be so many veterinarians, inspired by a common cause, gathered under one roof as in New Orleans this fall. Let it be our slogan "A Greater American Veterinary Medical Association." The future reveals marvelous opportunities and we must grasp them as we pass along with the full determination of holding the units together in order that we may accumulate an unusual degree of potential energy. This is the psychological time to fully develop our resources and no man with a spirit will take it for granted that the thing untried is beyond him.

Early in the spring the writer, as chairman of the Committee of Arrangements, commenced through THE JOURNAL, under

Association News, to interest the veterinary profession in the coming meeting in New Orleans. Every issue from May down to the present time has contained a variation of useful information, and if it has served the purpose, the author has been well repaid for his efforts.

The long-looked-for time will soon be here, and this is the last opportunity that the writer will have available to appeal to you to come to the Crescent City for the purpose of participating in one of the greatest scientific organizations in the world, composed of a body of men whose motto is "I Can." The life that is fightless is worthless, and it is man's proudest privilege to solve and overcome the forces of adversity.

E. I. S.

OUR FRIEND DR. RUTHERFORD OF OTTAWA KEPT BUSY.

Much to the disappointment of his numerous friends, it is doubtful whether Dr. J. G. Rutherford, an ex-President of the A. V. M. A., will be able to attend the New Orleans meeting. In addition to his work on the Railway Commission for Canada, he is Chairman of a Special Commission for the purpose of investigating the possibilities of the development of the reindeer, musk ox, and caribou in the Arctic and sub-Arctic regions of "Our Lady of the Snows;" and his work as special Royal Commissioner to inquire into matters connected with the conduct of running race meetings, etc., which we alluded to in the October Journal, will occupy considerable of his time, as he has called a series of hearings in this inquiry which will extend through the prairie provinces and British Columbia, and it will be well into November before the Doctor gets back from the Pacific Coast.

In a communication to the editor, Dr. Rutherford says: "Personally, I am for the time being pretty well divorced from the veterinary profession, but as you will probably realize, it is somewhat difficult for a man who has spent his life in it to forego all interest in its activities, even if he wanted to, which is certainly not the case with me."

We wish for the Doctor a pleasant trip, but we are sorry at the likelihood of his being absent from the A. V. M. A. meeting in November.

HOW TO RAISE STANDARDS IN VETERINARY EDUCATION.

By WILLIAM N. BERG, Washington, D. C.

- I. Introduction.
- II. Progress of medical education since 1904.
- III. Methods used by the Council on Medical Education.
 - a. Determination of the medical needs of the country.
 - b. Classification of medical schools.
 - c. Publicity.
 - d. Other activities of the Council on Medical Education.
- IV. Bibliography.

I. INTRODUCTION.

The main purpose of the present paper is to call attention to the following:

(1) The unfortunately low standards in veterinary education as compared with those in human medicine.

(2) As late as 1904 the general level of medical education was practically no higher than that of veterinary education at the present time.

(3) In 1904 the medical profession faced the situation squarely and openly. Through the American Medical Association a vigorous campaign was launched against fraudulent and low grade medical schools. These were forced to close and medical education placed upon standards inferior to none other.

(4) The same can be done and should be done by the American Veterinary Medical Association for veterinary education. If properly approached, perhaps such agencies as the Carnegie Foundation for the Advancement of Teaching and the American Medical Association would coöperate.

(5) An upward revision in veterinary educational standards can probably be brought about by applying the methods of the above agencies to veterinary colleges, examining boards, etcetera.

The numerous recent discussions on veterinary educational standards and the need for their revision speaks well for those who are moved by enlightened discontent. The general feeling seems to be that veterinarians as a class should be as well trained as medical men and should occupy the same station in life. That they are not as well trained as medical men and do not occupy the same high place needs no proof. It is shown by the long

fight necessary before the veterinarians obtained "recognition" in the army.

The following quotation is from the Bulletin of Yale University, School of Medicine, 1918-1919, p. 19:

"ADMISSION OF STUDENTS.

PREPARATION FOR MEDICAL STUDIES.

Students who enter college with the idea of subsequently studying medicine should realize that the broader the foundation a professional man can obtain the more efficient he will be. Those who are in a position to do so are recommended, therefore, to complete their college course before entering the School of Medicine, including in it the necessary special studies in the sciences.

In view of the fact that circumstances do not permit all prospective medical students to complete their college course, *two years of college work has been fixed as the minimum general requirement for matriculation in this school.* Work in Schools of Dentistry, Pharmacy and Veterinary Medicine is not accepted as the equivalent of college work."

The last sentence shows how high veterinary colleges stand in the esteem of certain university authorities. Although this sentence was not found in several other medical school catalogs it is plainly implied there. This means that a second year student in Cornell Veterinary Medical College, for example, who changed his mind and decided to study human medicine, would find that he was not eligible to enter the medical schools of Yale and other universities, although he had just finished two years in a good professional school.

But veterinarians need not permanently lag behind in the educational procession. Fifteen years ago medical education in the United States was at as low level as veterinary education is today. Through a vigorous campaign many improvements have been made until at present, the high grade medical schools here are as good as those in Europe. If the marked improvements to be described presently, can be made by medical men why can they not be made by veterinarians? The work of the American Medical Association in raising medical educational standards is nothing short of wonderful. The methods used are described in the literature; there are no secrets and it ought to be possible for the veterinary medical profession, through its association, to conduct a similar campaign with similarly splendid results.

II. PROGRESS OF MEDICAL EDUCATION SINCE 1904.

This is well described by Colwell, (4, p. 3.)†

“In previous reports attention was called to the rapid improvements in medical education in the United States, secured through a campaign which was begun by the American Medical Association in 1904. At the beginning of the campaign, the number of medical schools in this country exceeded the total in all the rest of the world. There was clearly an oversupply of medical schools. Many of them were poorly equipped and adhered only to low entrance requirements, while some were conducted for profit and required for admission little or nothing in the way of educational qualifications. It was shown that in 1904 only four medical colleges were requiring any college work for admission, and only from 20 per cent to 25 per cent were actually requiring a four-year high-school education. Under the methods pursued, it is not surprising, therefore, that in 1904 the number of medical students reached the amazing total of 28,142, and that in that year 5,747 physicians were graduated.

The campaign for improvement successfully urged the merging of two or more medical colleges in each of our various cities or States. This resulted in a rapid reduction in the total number, but a material strengthening of the quality of the institutions remaining. At the same time higher standards of preliminary education were urged consisting, first, of the four-year high-school education, then one year, and finally two years of premedical college education. In 1916 the two-year entrance standard was made an essential for any medical school to be considered as acceptable by the American Medical Association. In that year 48 colleges had already put into effect the higher requirement and also 16 State boards had made it the minimum essential of preliminary education of graduates who might seek licenses in those States. Attention was also called to the great improvements in the way of full-time salaried teachers, greatly improved laboratories, the closer relations with teaching hospitals, and the securing of greater endowments.

At the present time there are 90 medical colleges; the number of students during 1917-18 was 13,630, and the number of graduates in 1918 was 2,670.¹ These lower figures represent the normal decrease that was expected under the increased entrance requirements, and are not due to the war. The following tabulation shows the decided increase since 1904 in the number of colleges which have enforced higher entrance requirements and in the number of students and graduates who have held the higher entrance qualifications:

†The figures in parenthesis refer to the bibliography, at end of the paper.

¹Altogether 2,807 students successfully completed the courses of the senior year. From 137, however, in the Universities of California and Minnesota and in Rush Medical College, the degrees have been withheld pending the completion of a hospital internship.

Entrance requirements	Colleges.				Students.				Graduates.			
	1904		1918		1904		1918		1904		1918	
	Number	Per cent.	Number	Per cent.	Number	Per cent.	Number	Per cent.	Number	Per cent.	Number	Per cent.
Four-year high-school education or less.....	158	97.5	7	7.8	26,391	93.8	631	4.6	5,378	93.6	258	9.7
One year of college work.....			34	37.8			5,944	43.6			1,147	43.0
Two years of college work.....	4	2.5	49	54.4	1,761	6.2	7,055	51.8	369	6.4	1,265	47.3
Totals.....	162	....	90	....	28,142	....	13,630	....	5,747	....	2,670	....

It is not probable that in 1904 more than about 30 colleges (20 per cent) were actually requiring a four-year high-school education as a minimum for admission.

Instead of 4 (2.5 per cent) medical schools which in 1904 required any college work for admission, for the session of 1917-18, 83 (92.2 per cent) medical schools required one or two years of such work; instead of only 1,761 (6.2 per cent) students enrolled in the higher standard colleges in 1904, during last year 12,999 (95.3 per cent) students were enrolled in the higher standard colleges; and instead of only 369 (6.4 per cent) graduates who were turned out by the higher standard colleges in 1904, at the end of last session 2,412 (90.3 per cent) graduated from those institutions. The 7 medical schools which still require only a high-school education or less for admission are also inferior in other respects, and are reported as not recognized by from 27 to 38 State licensing boards. This general adoption by medical schools of the two-year standard of preliminary education and the other improvements made have brought medical education in this country to a par with that of leading countries of Europe and elsewhere."

How did the American Medical Association bring about these splendid reforms? A Council on Medical Education was formed, composed, of course, of men who understood the nature of the improvements to be made. The Council studied the medical needs of the country, *i. e.*, how many physicians are desirable per 1000 inhabitants; how many graduates per year; and how many good medical schools are required. Secondly: the Council proceeded to classify or grade the medical schools on their merits with a view to the elimination of those that were obviously unfit; the merging of small schools into larger and better ones; the unification of the curriculum etc. Thirdly: the Council engaged in a campaign of publicity that mercilessly exposed many poor schools run for profit as well as numerous schools that plainly were frauds. Fourthly: the Council has undertaken and carried

on numerous lines of work such as classifying the high schools and colleges; unifying entrance requirements, etc. These activities will be described more in detail.

The Council apparently has no legal authority; it is a civilian body, not connected with any government office. Nevertheless their publications, suggestions and classifications have almost as much force as if authorized by law.

III. a. DETERMINATION OF THE MEDICAL NEEDS OF THE COUNTRY.

According to Colwell, (4, p. 10):

"Statistics show that this country has one physician to every 739 people, as compared with one to every 1,500 to 2,500 people in the countries of Europe just before the war began. In recent years, however, the demand for medical graduates to fill positions as hospital internes, health officers, medical inspectors, medical teachers, and other positions of responsibility has been greatly increased. This increased demand is due, not to any scarcity of medical graduates, but to the improved qualifications of those now graduating from our medical schools. In earlier years this demand was not so great because few of the graduates then turned out were sufficiently qualified, educationally or professionally, to occupy the positions now open to them. The increase in the demand has been in direct proportion to the improvements in preliminary and medical education."

Is it not probable that the needs of the country for veterinarians could be ascertained, by the American Veterinary Medical Association, and the number of veterinary medical schools regulated accordingly?

Why should not trained veterinarians be employed as health officers, medical inspectors, etc., as well as medical men? They probably would be employed outside of strictly veterinary lines were they as well trained as their medical colleagues.

III. b. CLASSIFICATION OF MEDICAL SCHOOLS.

It is important to note that after classifying the medical schools the Council on Medical Education published its lists broadcast, so that everyone, and especially the prospective student, could thoroughly understand the basis of the classification; which schools were good, and why. The present standards for grading medical schools, although higher than those for veterinary schools, are temporary only; they will be raised higher still, (6, p.15; and 1, p. 127).

In the "Choice of a Medical School," a publication designed specially for the information of the prospective medical student, the Council gives the detailed schedule for the grading of medical schools. The following extracts from the schedule are sufficient to show its general scope.

STANDARDS OF THE COUNCIL ON MEDICAL EDUCATION OF THE AMERICAN MEDICAL ASSOCIATION.

SCHEDULE FOR THE GRADING OF MEDICAL SCHOOLS.

Schools will be rated on civil service basis on a scale of 1,000 points. The data relating to each school will be grouped under ten general heads in such a manner that the groups will have as nearly equal weight as possible, each group allowing a possible 100 points (10 per cent) out of a possible 1,000 points (100 per cent.). The revised schedule showing the general heads under which the data will hereafter be arranged is as follows:

1. Character of curriculum, grading of course, sequence of subjects, supervision, administration, etc.
2. Medical school buildings; adaptability, light, heat, ventilation, cleanliness, etc.
3. Laboratory facilities and instruction.
4. Dispensary facilities and instruction.
5. Hospital facilities and instruction in medicine, surgery, obstetrics, and gynecology.
6. Hospital facilities for instruction in medical specialties and provision for clinical clerkships, necropsies, etc.
7. Full-time instructors and assistants with special reference to their special qualifications and evidences of their work, including research.
8. Faculty, number, qualifications and organization of, including the staff of teaching hospitals.
9. Library, museum, charts and special apparatus and evidences of the use made of them.
10. Showing of graduates at state board and other examinations and other evidences by which the training received is indicated.

It will be noted that financial income is not referred to in the ten heads outlined. It is quite evident, however, that no college can secure an adequate number of expert full-time teachers, provide well equipped laboratories, library and museum, and be conducted in accordance with present-day medical knowledge without a liberal income in addition to students' fees.

Meaning of Classes A, B, and C.

Class A Colleges will, as heretofore, be those which are acceptable; Class B, those which, under their present organization, give promise of being made acceptable by general improvements, and Class C those

(a) Which require a complete reorganization to make them acceptable.

(b) Which do not keep satisfactory records of their students in regard to entrance requirements, attendance, grades in courses, division into classes and reasons for promotion.

(c) Which do not enforce their requirements in regard to admission (including those admitted to advanced standing), promotion and graduation.

- (d) Which give the major portion of their instruction after 4 o'clock in the afternoon.
- (e) Which are privately owned and conducted for profit.
- (f) Which for other specific reasons are not eligible for inclusion in Class B.

ESSENTIALS OF AN ACCEPTABLE MEDICAL COLLEGE.

(Revised to June 15, 1918)

The following outline of the essentials of an acceptable medical college was issued by the Council on Medical Education of the American Medical Association for its suggestive value in the rapid development in progress in the medical colleges of the United States. It also represents the standard by which medical colleges are measured in the Council's classifications.

REQUIREMENTS FOR ADMISSION.

1. The minimum requirement for admission to an acceptable medical college is a four-year high school education or its full equivalent and two years of work in a college of arts and sciences approved by the Council as follows:

I. High School Requirements.

II. Premedical College Course.

(c) Beginning Jan. 1, 1918, the minimum requirement for admission to acceptable medical schools, in addition to the high school work specified above, will be sixty semester hours of collegiate work, extending through two years, of thirty-two weeks each, exclusive of holidays, in a college approved by the Council on Medical Education. The subjects included in the two years of college work should be in accordance with the following schedule:

SCHEDULE OF SUBJECTS OF THE TWO-YEAR PREMEDICAL COLLEGE COURSE.

Sixty Semester Hours* Required

Required Subjects:	Semester Hours
Chemistry (a)	12
Physics (b)	8
Biology (c)	8
English composition and literature (d)	6
Other nonscience subjects (e)	12
Subjects Strongly Urged:	
French or German (f)	6-12
Advanced botany or advanced zoology	3 -6
Physiology	3 -6
Advanced mathematics, including algebra and trigonometry.	3 -6
Additional courses in chemistry	3 -6
Other Suggested Electives:	
English (additional), economics, history, sociology, political science, logic, mathematics, Latin, Greek, drawing.	

*A semester hour is the credit value of sixteen weeks' work consisting of one lecture or recitation period per week, each period to be not less than fifty minutes net, at least two hours of laboratory work to be considered as the equivalent of one lecture or recitation period.

SUGGESTIONS REGARDING INDIVIDUAL SUBJECTS.

(a) *Chemistry*.—Twelve semester hours required.

III. Approved Colleges of Arts and Sciences.

A tentative list of colleges of arts and sciences approved by reliable standardizing agencies has been prepared by the Council on Medical Education, and revisions of this list will be published from time to time.

Undue liberality in the acceptance of certificates from secondary schools unendorsed by approved standardizing agencies will be registered by the Council as a failure to comply with its requirements and the college will be dropped from the approved list.

FACULTY.

9. (a) The college should provide at least *eight expert thoroughly trained professors in the laboratory branches*, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects.¹¹ There should also be a sufficient number of assistants in each department to look after the less important details. For colleges having *sixty students or less* in each class, there should be *at least one full-time salaried assistant each in the departments* of (1) anatomy, (2) physiology (3) pathology and bacteriology, and (4) physiologic chemistry and pharmacology, and *one additional assistant in each of these departments should be provided for each additional thirty students enrolled*. This represents a low average of the full-time assistants already employed by the acceptable medical colleges.

(b) The faculty should be made up of graduates of institutions recognized as medical colleges. * * *

This last requirement was perhaps made necessary by such conditions as the following: Flexner, Carnegie, Teaching; Bulletin 4, p. 176, 1910.

"Chicago, varied and picturesque in this as in all else pertaining to medical education, supports four postgraduate institutions. Only unmistakable scientific activity could dislodge the unpleasant suspicion of commercial motive thus suggested. No such activity is in any of them observable. A cynical candor admits in one place that 'it pays the teachers through referred cases;' in another, 'it establishes the reputation of a man to teach in a postgraduate school;' in a third, 'it pays through advertising teachers.' In one a youth was observed working with a microscope. Inquiry elicited the fact that he was the teacher of clinical laboratory technique, lecturing in the absence of the 'professor.' The following dialogue took place:

'Are you a doctor?'

'No.'

'A student of medicine?'

'Yes.'

'Where?'

'At the Jenner Night School.'

'In what year?'

'The first.'

A first-year student of medicine in a night school was thus laboratory instructor and pro tempore lecturing professor in clinical microscopy in the Chicago Polyclinic."

OTHER TEACHING FACULTIES AND FINANCES.

18. Statistics show that modern medicine cannot be acceptably taught by a medical school depending solely on the income from students' fees. No medical school should expect to secure admission to, or be retained in Class A, therefore, which does not have an annual income of at least \$25,000 in addition to the amount obtained from students' fees.

For a criticism of the Council on Medical Education's classification of medical schools, see Pritchett; Ninth Annual Report; Carnegie Foundation for the Advancement of Teaching, p. 61, 1914.

In comparing the standards of the Bureau of Animal Industry (8) with those of the Council on Medical Education attention may be centered on the two important criteria, as stated by Pritchett (2, p. 70):

"These two criteria—the basis of selection of the student body and the basis of selection of the teaching body—to my thinking outweigh all other considerations."

Undoubtedly the Bureau adopted the highest standards practical under the conditions. The Bureau's two year high school requirement for entrance effective September 1918 seems to be well in advance of the actual requirements of many veterinary colleges according to the following quotation from the Report of the Association of State and Provincial Veterinary Colleges' Committee on Entrance Requirements, May, 1919 (9, p. 236):

"Your committee recommends that this association most heartily endorse the amendment offered by Dean L. A. Klein at the Kansas City meeting, which is as follows:

Beginning with the collegiate year of 1918-19, the matriculation requirements of an approved veterinary college shall be not less than one year of high school work or equivalent studies taken in other preparatory schools. Beginning with the collegiate year of 1919-20, said requirements shall be not less than two years of high school work or equivalent studies taken in other preparatory schools. Beginning with the collegiate year

of 1920-21 the matriculation requirements shall be not less than four years of high school work * * * .”

A comparison of the requirements shows, for example, that for admission to a medical school acceptable to the Council the prospective student must have completed a four year course in a high school and two years study in the sciences in a college, while the prospective veterinary student, to enter an accredited veterinary college need offer only two years of high school work (8, p. 3). It is true that some of the veterinary colleges have entrance requirements of four high school years. It is equally true that many medical schools have entrance requirements higher than the minimal requirements of the Council. Thus the Johns Hopkins University Medical School receives as candidates for the degree of Doctor of Medicine, college graduates only (p. 54, J. H. U. Circular of the Medical Department 1918-1919). The Harvard Medical School have the following requirements for admission: (Official Register of Harvard University; Vol. 15, Dec. 28, 1918, page 30:

“As candidates for the Degree of Doctor of Medicine the School receives the following:

I. Graduates in arts or science of approved colleges or scientific schools.

II. Students who have two years of work in a college or scientific school of high rank, provided they present certificates that they have maintained a rank in the first third of their class.”

With regard to the second criterion, the basis of selection of the teaching body, it is to be noted that the faculty of an acceptable medical school (p. in Journal A. V. M. A., 9 a) must have at least eight full time professors, who devote their entire time to instruction and research. The faculty of an accredited veterinary college need have but five professors:

Circular 128, p.7: “Regulation VII.—Number of veterinarians.

On the faculty of every veterinary college there shall be at least five graduate veterinarians from accredited veterinary colleges teaching major subjects, each of whom shall have had not less than one year's additional training in some accredited veterinary college or three years' experience in teaching or in practicing veterinary science subsequent to graduation from an accredited veterinary college.”

But none of the regulations require that any of the five on the faculty shall be full-time instructors or that they shall be interested in research.

The idea that a good medical faculty should consist entirely of medical practitioners who incidentally teach, is no longer taken seriously. Section 9 a (p. in Journal A. V. M. A.) of the Council's schedule ought to apply to veterinary faculties. The following table shows that in two very important respects—the selection of the student body and the selection of the teaching body—the veterinary colleges are woefully behind the medical schools.

MINIMAL REQUIREMENTS.

As defined by the Council on Medical Education (5 and 6) for medical schools and the Bureau of Animal Industry (8) for veterinary colleges.

	Medical Schools	Veterinary Colleges.
Admission.....	4 years high school and 2 years college	2 years high school
Teaching weeks per college year.....	32	28
Total hours, four year course.....	3,840	3,380
Full time instructors on faculty.....	8	0
Part time instructors on faculty.....	....	5

III. c. PUBLICITY.

As an example of the numerous publicity activities of the Council, and especially of their desire to inform the prospective student of the relative merits of the various schools, the two following parts of statistical tables are taken from "Choice of a Medical School." These tables are so complete that they alone are sufficient to indicate the desirable schools. And as numerous studies have shown, the high grade schools are no more expensive to the student than the poorer ones. It is to be noted that the high grade medical schools have on the average, one instructor for every 2 or 3 students. The complete tables 1 and 2 contain data on 105 and on 96 medical schools respectively.

TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (Census of 1916)	Classification by Council on Medical Education.	No. of Students Registered, 1917-18		Graduates 1918		Grade, with A.B., B.S., or Ph.B.	Number of Teachers	Weeks in College Year	Total Fees (Dollars)			
				Men	Women	Men	Women				1st year	2nd year	3rd year	4th year
1	ALABAMA University of Alabama School of Medicine, Mobile.....	58,221	A	44	.....	11	.....	4	42	32	165	160	160	185
2	ARKANSAS University of Arkansas Medical Department, Little Rock.....	57,343	B	52	.....	11	.....	4	56	34	50	50	50	50
3	CALIFORNIA College of Medical Evangelists, Loma Linda.....	125	B	425	45	76	10	10	40	36	166	161	161	161
4	College of Physicians and Surgeons, Los Angeles.....	503,812	B	83	9	25	3	3	122	36	220	217	202	227
5	Oakland College of Medicine and Surgery, Oakland ¹	136,604	C	15	2	3	.....	.....	40	39	193	193	193	218
6	College of Physicians and Surgeons of San Francisco.....	463,516	C	53	3	15	.....	.....	72	34	200	155	150	150
7	Hahnemann Medical College of the Pacific, San Francisco.....	463,516	B	10	1	10	1	7	72	34	200	155	150	150
8	Leland Stanford Junior Univ. School of Med., San Francisco.....	463,516	A	72	10	5	2	137	137	34	200	155	150	150
9	University of California Medical School, San Francisco.....	463,516	A	135	15	6	2	7	66	32	85	85	75	75
10	COLORADO University of Colorado School of Medicine, Denver ³	260,800	A	73	4	6	2	7	66	32	85	85	75	75

TABLE 1 (Continued)

Marginal Number	NAME AND LOCATION OF COLLEGE	Executive Officer	Session of 1918-19		Marginal Number
			Begins 1918	Ends 1919	
1	ALABAMA University of Alabama School of Medicine, Mobile.....	T. H. Frazer, M. D., Dean.....	Oct. 3	June 4	1
2	ARKANSAS University of Arkansas Medical Department, Little Rock.....	Morgan Smith, M. D., Dean.....	Sept. 16	June 4	2
3	CALIFORNIA College of Medical Evangelists, Loma Linda.....	Newton Evans, M. D., President.....	Sept. 1	May 29	3
4	College of Physicians and Surgeons, Los Angeles.....	Charles W. Bryson, M. D., Dean.....	Sept. 3	June 12	4
5	Oakland College of Medicine and Surgery, Oakland.....	H. D'Arcy Power, M. D., Dean.....	Aug. 12	June 5	5
6	College of Physicians and Surgeons of San Francisco.....	William Ophuls, M. D., Dean.....	Oct. 1	June 17	6
7	Hahnemann Medical College of the Pacific, San Francisco—H. ²	Frank W. Lynch, M. D., Acting Secretary.....	Oct. 28	June 4	7
8	Leland Stanford Junior Univ. School of Med., San Francisco.....				8
9	University of California Medical School, San Francisco.....				9
10	COLORADO University of Colorado School of Medicine, Denver ³	Charles N. Meader, M. D., Dean.....	Sept. 30	June 4	10

THE DIFFERENTIAL FEATURES BETWEEN MELANOSIS AND MELANOSARCOMA.*

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PART ONE: A REVIEW OF THE LITERATURE.

This subject has always attracted a considerable amount of attention among the veterinary profession, not only because it is so common among domesticated animals but also because of the striking appearance of this process. Other tumors blend in more or less with the surrounding tissues, while in this case the black patches or nodules stand out in contrast to the neighboring structures. The interest aroused is reflected in the various theories that were advanced regarding its nature, diagnosis, and particularly the prognosis of this affection. Much as has been written upon this subject, we are still in the dark concerning certain phases of the process of this autochthonous pigment. The subject of pigmentation is alive even today. In studying pathology, we were taught that there are three varieties of autochthonous or endogenous pigments, melanin, lipochrome, and haemofuscin. Recently, Dolley and Guthrie pointed out that melanin is the only endogenous pigment, and that lipochrome, and perhaps also haemofuscin, should be classed with the exogenous pigments. They also demonstrated that the melanin found in nerve cells is a product of chronic depression, and does not belong there normally.

The term melanosis indicates an abnormal deposit of melanin in various parts of the body. As used in the veterinary literature it indicates a benign pigmentation of the tissues. It may be localized, or more or less distributed through the various organs of the body, in which case it is known as generalized melanosis. The term melanosarcoma denotes an embryonal connective tissue tumor that in its growth infiltrates the surrounding structures and spreads throughout the body by metastasis. It is classed with those sarcoma that undergo secondary changes. In this case the secondary change is a deposition of melanin.

Melanin is an endogenous pigment. It appears to be a product of proteid metabolism. It usually contains the elements

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carbon, hydrogen and nitrogen in the general proportions of 1, 5, 5. It is said to be free from sulphur and iron, but possesses a strong tendency to unite with these elements. It may be dissolved slowly by strong alkalis, and bleached by peroxid of hydrogen, chlorin, and by 10% potassium permanganate followed by dilute sulphurous acid. Heated with strong alkali, melanin from tumors yields indol, skatol, volatile fatty acids, and an ether soluble acid which gives a dark blue color with ferric chloride. The chief product is melanic acid. Injected subcutaneously, melanin is apparently converted into a colorless substance, melanogen, which is excreted in the urine, the latter turning brown or blackish brown on standing. Artificially melanin may be obtained by heating together proteids and strong HCl.

Piettre isolated from sarcomatous tumors in horses a protein fraction and a more condensed jet-black nucleus insoluble in acids but easily soluble in alkalis.

Melanin occurs as sepia in the ink sac of the cuttlefish or squid. This animal uses this ink to protect itself against possible enemies. On the approach of an enemy it liberates the ink, blackening a considerable area of the water around it, thus blinding its opponent. It occurs in the skin, hair, retina and choroid coat of the eye in man and animals excepting, perhaps, the albinos. Gortner obtained from white rabbits, from albino silky fowls, and from white leghorn fowls a product similar to the "white melanin" which Spiegler obtained from sheep's wool and white horse hair. He states, however, that it is a result of the action of alkalis upon keratin and not true melanin. Melanin also occurs in the cerebro-spinal meninges and in the intima of the aorta in certain animals. In calves and other animals it often occurs on the serous surfaces and in the intermuscular connective tissue in the form of black spots. The greatest amount of melanin is found in the melanosarcoma. No estimation as to the amount of melanin has been made in animals. In the negro's skin the amount is 1 gm. In a case of melanosarcoma in man, the liver contained 300 gms. and the subject about 500 gms.

The melanotic pigment is produced by chromatophores. These are specialized cells normally found in the skin in a dormant state. It is derived, according to Schultz, directly from the nuclear materials. Chromatin is thrown out of the nucleus

into the cytoplasm. This chromatin becomes changed into a material having the staining reactions of nucleolar substance. Further change leads to the transformation of this material into pigment. He points out that this pigment is not a hemoglobin derivative or a degeneration in the ordinary sense. It is the product of the specialized physiological activity of the cell by which nuclear derivatives are transformed directly into pigment. He considers these cells as mesodermal in origin. In changing from a dormant to an active state, they seem to take up fluid and swell, then multiplication takes place by mitosis and later, more rapidly, by amitosis. In the work of Von Szilly, the pigment bearers were found to arise from the chromatin of the nucleus and pass into the cytoplasm. He concludes that some of these are of a degenerative type and their appearance is associated with a partial breakdown of the nucleus. The change of colorless pigment bearers into pigment is brought about by specific cell ferments, which act on the chromatin.

According to Gortner, the formation of melanin is brought about by the interaction of an oxidase and an oxidizable chromogen. He distinguishes at least two types of melanin. Those that are soluble in dilute acids he calls melano-proteids. Those that are insoluble in dilute acids are of an unknown constitution and found in the form of granules.

Von Fürth regards melanin as developed by the action of intracellular oxidases ("tyrosinase") upon the chromogen groups of the protein molecule. A tyrosinase has been demonstrated in the ink sac of the cuttlefish. Gessard demonstrated the presence of tyrosin and tyrosinase in the melanoma of the horse, and concluded that the pigment of tumors and that of the cuttlefish are produced by the action of tyrosinase on the tyrosin and other aromatic compounds.

Halle demonstrated that under the influence of an enzyme contained in the adrenal, tyrosin is converted into adrenin. It is when the adrenal or its secretion is deficient, as occurs in Addison's disease, that the bronzing of the skin occurs. The greater pigmentation of exposed parts has been explained by the more active oxidation of these parts.

Jaeger claims that the production of melanin is a secretion of the cell plasma brought about by a melanogenic ferment, so

that the suprarenin present in the cytoplasm is transformed into a black pigment by oxidation.

The question as to whether the chromatophore is of ectodermal or mesodermal origin has attracted considerable attention. It is even at the present time far from settled. Most authors tend toward the opinion that it is of mesodermal origin. There is a good deal of evidence, however, that the chromatophore is an epithelial cell. In man there are often found congenital brown or black areas on the skin, called pigmented moles or nevi pigmentosi. These areas may be flat or slightly raised, and often give rise to metastases. Ziegler, claiming that the chromatophore is a specialized lymphendothelial cell, classified these moles as hypertrophic lymphangioma. Ewing suggests that until further knowledge on this subject is obtained, the name melanoma be used to include these nevi, the melanotic spots in the eye, and the pigmented areas in the meninges. He suggests that where the cells may be distinguished as mesodermal they may be called melanosarcoma, and epithelial malignant tumors containing melanin be called melanocarcinoma.

Jaeger, in his studies on melanosis in calves, concludes as follows:

1. Melanosis in calves and sheep as well as in rare instances in full grown cattle, is congenital.
2. The pigment cells are lymph-endothelial cells.
3. The melanin production is in the cell itself. This differentiation is not brought about by any influence outside that cell. These cells may multiply and become transformed into tumor cells.
4. Calf melanosis is different from melanosarcomatosis. In the latter they are connective tissue cells that acquire, later in the life of the organism, through certain influence, a power to produce pigment.

MacLachlan recorded a case in man of extensive pigmentation of the brain associated with nevi pigmentosi of the skin. He described the chromophores as being oval and spindle shaped. The latter invariably contained pigment. The oval cells did not always contain pigment. These were often perivascular. He concluded that this is a benign melanotic tumor primary in the brain, and the other primary in the skin.

The point of origin of malignant melanomas in man is chiefly the nevi pigmentosi in the skin and the choroid coat of the eye, less frequently in the meninges, rectum, and other organs. In rare cases no local point of origin can be demonstrated clinically or at autopsy. In the domesticated animals the point of origin seems to be mainly in the skin usually at the base of the tail, in the region of the shoulder, or in the mammary glands. Also in the meninges and in the cæcum. In the cases described in the veterinary literature, however, many of the descriptions were such as to make it impossible to determine the point of origin. Furthermore, the term melanosis is used rather loosely, very often to designate the condition known as melanosarcoma. I shall endeavor to review briefly the literature.

Andrieu described a case of melanosis in the kidneys of a two months old heifer.

Wooldridge reported a case of arborous deposits in the omentum and on the capsule of the spleen of a bullock.

Bailleux and Digive described a case of melanosis in a calf. They considered it as a result of hemorrhages in which the hematin was changed to melanin.

Bru recorded a case of generalized melanosis in a heifer that showed no emaciation or general physiological disturbance. The spinal cord was found to be of a black color throughout with extension into the nerves for some distance from the cord. The brain membranes were thickened and covered with a dark-colored fluid.

Mettam reported a case of melanosis in the lungs and liver of an ox. The animal was in good condition, and the carcass passed for food. The lungs contained black patches from the size of a lobule to that of the palm of the hand. The cortical portion of the bronchial gland was pigmented. In the liver the pigment was scattered beneath the serous surface, and extended into the interlobular tissue in fine arborescent ramifications. Microscopically, in the alveolar walls of the lung, the pigment was in fine granules appearing like minute cocci. The pigment was contained in large branching cells in the lymphatics, clefts and spaces. Some of the pigment was in leucocytes and in vascular endothelium. These cells were largely found around the blood vessels. He has excellent figures showing the location of the pigment.

Young observed a case of a red and white cow with melanosis in the lungs, capsule of liver, subcutaneous connective tissue of the back, the spinal cord, pleura, peritoneum, and lymph glands. The carcass was passed for food and no ill effects were reported from the customers who used it.

Lewin described a case of generalized melanosis of a four year old hen in which the feathers, beak and skin were bluish black. The intermuscular connective tissue contained various-sized melanotic spots. The serous membranes, the intestinal mucosa, and the periosteum were black. The bones contained black spots, and the bone marrow was dark red. There were small black spots on the gizzard, and on the pericardium. Microscopically, the pigment was in the form of fine granules that were deposited in the tissues.

These cases are those of melanosis. They do not present the characters of malignancy. There is no cachexia, emaciation, or other evidence of intoxication or disturbed metabolism. The deposits are not in the form of extensive nodular growths. The following are cases of melanosarcoma and called so by the authors or designated as melanosis.

Heulsen reported a case of a melanotic tumor of the tail in a bay horse that recurred seven months after removal.

Lathrop recorded a case of a melanotic tumor on the tail of an eighteen year old bay gelding. This was extirpated. Seven months later this animal had a tumor eight inches in diameter at the same spot, and a small growth underneath the tail and near the base. The original tumor was two and a half inches in diameter.

Harrison described a case of a melanotic tumor on the sacro-lumbar plexus of a horse causing partial paralysis. There was a history of a fall, and the clinical diagnosis was given as locomotor ataxia and fracture of a vertebra. The autopsy revealed a melanotic tumor the size of a hickory nut imbedded into the bony structures, surrounding and pressing upon one of the main branches of the posterior portions of the lumbar plexus.

Harrison recorded a case of a four pound melanotic tumor in the cæcum of an eighteen year old brown gelding.

Peters described a case of melano-sarcoma in a twelve year old mare that showed stiffness behind at first, then also in the back and neck. Later she had difficulty in feeding from the

ground and began to stagger, like a horse with spinal meningitis. On autopsy, melanotic tumors were found in the spleen, liver, lungs, dorsal and lumbar vertebræ, the sixth rib, the mammae, and three small nodules were found in the skin under the tail.

Cagny observed a melanotic tumor in a mare that was attached to the sacrum, and pressed upon the iliac arteries.

Martin recorded a case of a grey gelding with a tumor, the size of a tangerine orange, on the side of the cheek. The sub-maxillary space and the left parotid region were filled with similar growths. The visceral and parietal peritoneum were studded with small melanotic tumors, the spleen and liver with larger ones. The right kidney and the mesenteric lymph glands were converted into one large black mass. The lungs, bronchial and mediastinal lymphatics were also badly affected. The heart was free from growths.

Koch found a melanosarcoma in the cardiac muscles of a grey horse.

Scott reported a case of melano-psammomata in the brain of an old grey mare. In each of the cerebellar hemispheres there was a dark grey neoplasm $3\frac{1}{4}$ and 2 oz. respectively. On section, it was gritty and varied in color from dark grey to black, and on squeezing, an inky colored liquid escaped. There was no melanosis around the anus or in other regions.

Rossignol recorded a case of a melanotic tumor of the shoulder in a grey stallion that was diagnosed and treated as a cold abscess. On autopsy the muscles mastoido-humeralis, posteaspinatus, and abductors of the arm were involved, as was also the stomach, large colon, and spleen. The liver and the thoracic organs were free.

Boyd reported a case of a cutaneous melanosarcoma of a cow in which good results were obtained by surgical interference.

Sammon described a melanotic sarcoma in a dog. The primary tumor was on the internal toe of the left fore foot. There were metases in all the organs except the liver.

Petit, Douville and Germain recorded a case of generalized melano-sarcoma in a black French poodle in which the skin at the base of the tail was involved, with a subcutaneous and inter-muscular chain of tumors extending from the caudal vertebræ to the sacro-iliac joint. The omentum and peritoneum were covered by small nodules. There were also metastases in the

mesenteric glands, intestines, kidneys, adrenals, spleen, liver, pleura, diaphragm, lungs, and the heart. The nervous system was free from lesions.

Ball and Cuny described a case of cutaneous melanosarcoma in a dog, primary on the level with the internal toe of the left paw. It was the size of a hazlenut, and it was ulcerated at one point. There were secondary growths on the skin over the entire body. There was no indication of glandular or visceral metastases.

Roberts observed in a brown pomeranian dog a spherical, pedunculated melanoma involving the cutis and subcutaneous tissue in the region of the croup. The affected area was hairless.

Taylor reported a case of an interdigital small melanotic tumor in a 3 or 4 years old spaniel. The tumor was lobulated, appearing like a fibromatous growth having many ramifications, and it was very adherent to the surrounding structures.

Seddon described a case of melano-sarcoma in an Irish terrier where no growth was found in the skin. There was metastasis in the lungs, spleen, mesentery, omentum, kidneys, pleura, pericardium and endocardium.

The following cases were called by the authors melanosis but are apparently melanosarcoma.

Bunker mentioned a case in a dog. He described it as a subcutaneous swelling and gave no microscopic findings.

Rogers recorded a case in a two year old dirty grey colt in which a nodule was removed and later recurred. This was evidently a melano-sarcoma.

Hoare described a case of a 30 pound tumor involving the ear with softening and necrosis of same. The subject was a bullock. He gave no microscopic findings. This is evidently a melanosarcoma since it showed evidence of infiltration and produced softening and necrosis of the ear.

Nicholas reported a case of a white horse that was condemned at an abattoir on account of generalized melanosis. "There were melanotic infiltrations and tumors in the bones and bone marrow. The pericardium, all the lymph glands, lungs, pleura, trachea, liver, and spleen were slightly affected. There were small deposits in the spongy portions of the maxillaries, occipital, and temporal bones. The spongy portions of the cervical vertebrae were extensively affected, gradually diminishing in the dorsal,

lumbar and caudal vertebræ. The sternum was extensively affected. The ribs were more or less involved. Of the bones of the trunk, the anterior ones were less affected than the posterior. In the scapula the spongy tissue was black, the periosteum was slightly affected and the cartilage of prolongation was free. The spongy tissue, the periosteum, and the articular cartilages of the humerus, radius and cubitus, coxæ, femurs, patellas, and the tibiae were more or less affected. From the carpus and tarsus down, every one was normal." No microscopic description was given. From this description, it is hardly possible to form an opinion as to whether this was a case of melanosis or of melanosarcoma. The "melanotic infiltrations and tumors," as well as the affectations of the lymph glands, tend toward it being melanosarcoma. The fact that this animal was to be used for food would perhaps indicate that he did not show any evidence of cachexia. This fact makes it possible that it was melanosis.

Harger described a case of a tumor in the parotid gland of a 9 year old grey gelding in which the gland was hard, lobulated, and enlarged to twice its normal size. He removed the tumor, and stated that most of these tumors, as seen in the horse are simple melanosis without any tumor neoformation. This tumor recurred five years later. Then he stated that prognosis is very doubtful, as many cases of melanosis recur, so that they are probably melanosarcoma. He said that melanosis when it stops growing and becomes encapsulated does not recur or undergo metastasis. He claimed that it begins in the sweat glands of the skin.

Bourdelle described a case of a horse that was slaughtered for food in which he found a lobulated mass resembling a blackberry in size and aspect. This was adherent to the cranial wall, infiltrating the arachnoid and pia mater, and pressing on but not involving the cerebral hemisphere. It was located on the right side at the limit of the frontal, temporal and sphenoid fossa. No other melanotic deposits were found in any other part of the body. The animal showed no symptoms of pressure on the brain. This is apparently a case of melanosarcoma primary in the cerebral meninges.

Edwards observed a case of a 10 year old grey hunter gelding that was suffering with gradually increasing lameness with facial paralysis. Melanotic deposits were found over the cerebellar

meninges, in the tracheal, bronchial, iliac, pharyngeal, prepectoral, and submaxillary lymph glands. The only evidence against this being true melanosis is the fact that it produced paralysis. It may be a melanosarcoma primary in the meninges.

Cuny reported a case of a seven year old grey percheron mare that died suddenly. On autopsy individual nodules varying in size from that of a pea to a hazelnut were found irregularly disseminated over the parietal and visceral pleuræ, on the ribs, diaphragm, and posterior mediastinum. Around the heart they formed big grapes, surrounding the cardiac muscle covering the auricles and large blood vessels. The anterior mediastinum was destroyed by a blockade of tumors surrounding the blood vessels and nerves. The pericardium and pulmonary structures were free. Under each shoulder there was a small melanotic "deposit." This is evidently a melanosarcoma primary perhaps in the skin at the shoulder.

Chambers described a case of a 13 year old grey mare "whose body was covered with numerous melanin deposits, principally in the parotid region. The presternal, precrural, popliteal, and other lymph glands were also diseased. This condition had been growing slowly for six years." This is apparently a case of melanosarcoma.

Cabret reported a case of a light grey gelding in which the tail, anus, sheath, flat of the thigh, urethral canal, and the inguinal lymph glands were filled with numerous melanotic deposits. There was a tumor the size of an apple on the trachea, and tumors were also found on the auriculo-ventricular openings of the heart, on the costal wall of the psoas muscle, and in the right plantar cushion. This is evidently a melanosarcoma primary in the skin.

Spreull mentions a case of an aged grey mare showing increased weakness behind and inability to rise. She had tumors of various sizes, some as big as a goose egg around the anus, vulva and perineum. Careful rectal examination revealed also a number of them extending along the course of the posterior aorta and vena cava as far as the arm could reach. The animal was destroyed and no post mortem was made. This is evidently a melanosarcoma.

Mulvey observed a case of a cat with a tumor a few centimeters back of the elbow discharging a pigmented liquid. From the main tumor there were a chain of smaller growths extending

down to the axilla. The lungs, liver, spleen, kidneys, mesentery, and lymph glands were affected. This is evidently a cutaneous melanosarcoma. The mother tumor showed secondary changes. It also distinctly shows metastases.

Pickens described a case of a three months old Duroc Jersey pig that was diagnosed by Dr. Welch as generalized melanosis. It appeared in good health until six weeks to two months old when it ceased to grow. Shortly after, the skin lesions made their appearance and developed rapidly until the pig was killed. On the left side there were irregularly shaped nodules cutaneously and subcutaneously above the eye, posterior to the base of the ear, over the anterior border of the scapula, at the angle of the jaw, a little above the sternum, and on the posterior side of the carpus. These nodules varied from 2 cm. in diameter and 1 cm. thick to 5 cm. long and 2 cm. in diameter. Some of these were firm, others contained a liquified center. The right eye was entirely involved by a fluctuating mass about 3 cm. in diameter. The center contained whitish viscid fluid resembling pus, with a decided odor. The rest of the mass was black but softer than the other nodules. There were cutaneous nodules above the angle of the ilium and in the right flank. The latter resembled a papillary epithelioma in its appearance, excepting that the fingerlike projections were black. Of the viscera the lungs and liver contained nodules from just visible to about 1 cm. in diameter. There were a few black areas in the large intestines, the largest being about 8 mm. in diameter. The pigment was present in all the coats. The cortex of the left kidney contained an area 4 mm. in diameter, and the cortex of the right kidney contained four black spots, the largest about 1 mm. in diameter. In the right sublumbar region and beneath the last two lumbar vertebræ there was an irregularly lobulated black mass 5 cm. long, $2\frac{1}{2}$ cm. in its widest place and 2 cm. thick, situated under the peritoneum. The capsules of the bronchial and mediastinal as well as some of the external lymph glands contained pigment. Otherwise, they, as well as the mesenteric lymph glands, were normal.

Microscopically the melanin was found in a supporting connective tissue containing blood vessels. Numerous polymorphonuclear leucocytes were scattered through the nodules some of them containing melanin. The infiltrated tissues showed either

necrosis or degeneration with the exception of the pleura, and the lymph glands.

Dr. Pickens confirmed the diagnosis of generalized melanosis on account of not being able to see any sarcomatous cells that gave rise to the melanin. Ewing points out that in malignant melanomas very little or no pigment may be present in the infiltrating cells. The cells may also contain an excessive amount of pigment. In the latter case it may lead to destruction of tissue and formation of cysts containing black fluid.

Some of the tumors from this case were left at my disposal. I succeeded in bleaching out sections of this material by immersing them for two to four days in peroxide of hydrogen. These bleached preparations were then stained with the usual stains. These tumors were found to be composed of groups of large spindle shaped cells and large round giant cells in nests. (Fig. 8.) Toward the center there were large endothelial cells held in a fine connective tissue stroma. Some of these cells were nucleated, others were without nuclei. A few cells contained two nuclei. In addition there were numerous blood vessels. In the center of these tumors was much necrosis. In these areas there were numerous polymorphonuclear leucocytes. Minus the pigment, therefore, the histological picture is typical of that of a sarcoma. Dr. Pickens did not mention the appearance of the sublumbar lymph glands. The mass in that region seems to be exactly where these lymph glands are normally situated. The nodule in the left submaxillary region is also suspicious of an involved lymph gland. The histological finding after removal of the pigment establishes the diagnosis of melanosarcoma, with the primary lesion perhaps in the right eye. There is a possibility that the animal had congenital melanosis which later developed into melanosarcoma.

Fitch, Boyd and Billings mentioned two cases. One was a ten years old grey mare with a melanoma of the right sacro-iliac articulation. The other was a grey gelding with many masses in the pelvic cavity. On autopsy "generalized melanosis was found but the most striking thing was the enormous melanotic spleen weighing 47½ pounds." No microscopic description was given. The illustration shows the spleen enlarged by large spherical nodules, apparently metastatic melanosarcoma.

LITERATURE

- Adami, J. G. Principles of Pathology, 1910, I, 806 and 956.
- Andrieu. Rec. de Med. Vet. Abst. Am. Vet. Rev., 1886, X, 518.
- Bailleux and Digive. Annals de Bruxelles. Abst. Am. Vet. Rev., 1886, X, 516.
- Ball and Cuny. Jour. de Zoötech. Abst. Am. Vet. Rev., 1911, XXXIX, 72.
- Bourdelle. Rev. Vet. Abst. Am. Vet. Rev., 1910, XXXVII, 392.
- Boyd, W. L. Cornell Vet., 1918, VIII, 125.
- Bru, E. Rev. Vet. Abst. Exp. St. Rec. XVI, 1027.
- Bunker, A. V. R., 1882, V, 34.
- Cabret. Rev. Vet. Abst. Am. Vet. Rev., 1912, XLII, 349.
- Cagny. Bull. de la Soc. Cent. Abst. Am. Vet. Rev., XXV, 1027.
- Chambers. Vet. Journ. 1911, LXVII (N. S. XVIII), 735.
- Cleland, J. B. Journ. Dept. Ag. West. Australia, 1907, XV, 84.
- Cuny. Jour. De Zoötech. Abst. Am. Vet. Rev. 1910, XXXVIII, 406.
- Dolley, D. H. and Guthrie, F. V. Presented before the 19th Ann. Meet. Am. Pathologists and Bacteriologists, 1919.
- Edwards. Vet. News. Abst. Am. Vet. Rev., 1912, XLI, 348.
- Ewing, James. Neoplastic Diseases. 1919, 849.
- Fitch, Boyd, and Billings. Cornell Vet., 1919, IX, 56.
- Gortner, R. A. Biochem. Bul. Abst. Exp. St. Rec., XXVII, 468. Am. Nat., 1910, XLIV, 497.
- Harger, S. J. J. Am. Vet. Rev., 1907, XXXII, 727; 1909, XXXV, 427.
- Harrison. Ibid. 1882, VI, 31; 1883, VII, 308.
- Hoare. Vet. Journ. Reprint. Am. Vet. Rev., 1887, XI, 280.
- Jaeger, A. Berlin. Tierärzt. Woch., 1911, XXVII, 793.
- Kitt. Th. Lehrb. d. Path. Anat. d. Haust., 1910, I, 213 and 310.
- Koch. Berlin. Tierärzt. Woch. Abst. Am. Vet. Rev., 1889, XIII, 511.
- Lathrop. Am. Vet. Rev., 1888, XII, 225.
- Lewin. Zeitschr. Veterinärk., 1910, XXII, 455. Abst. Berlin. Tierärzt. Woch., 1912, XXVIII, 567.
- MacLachlan, W. W. G. Journ. Med. Res., 1914, XXIX, 433.
- Martin. Vet. Record., XXIII, 634.
- Mettam. Vet. Journ., 1909, LXV (N. S. XVI), 601.
- Mulvey. Vet. Record, XVIII, 614.

- Nicholas. Journ. d. Zoötech., 1905. Abst. Am. Vet. Rev., 1905, XXIX, 326.
- Peters. Vet. Journ., 1909, XLV (N. S. XVI), 453.
- Petit, Douville et Germain. Bull. d. l. Soc. Cent. Abst. Am. Vet. Rev., 1912, XLII, 228.
- Pickens, E. M. Journ. Am. Vet. Med. Assoc., 1919, LII, 707.
- Piettre, M. Compt. Rend. Acad. Sci., 1911, CLIII, 785.
- Remond. Rec. D. Med. Vet. Abst. Am. Vet. Rev., 1911, XL, 801.
- Roberts. Vet. Record. Abst. Am. Vet. Rev., 1909, XXXVI, 65.
- Rogers. Am. Vet. Rev., 1884, VIII, 264.
- Rossignol. Bul. d. l. Soc. Vet. Prat. Abst. Am. Vet. Rev., 1914, XLV, 353.
- Sammon. Journ. d. Zoötech. Abst. Am. Vet. Rev., 1913, XLIV, 255.
- Schultz, O. T. Journ. Med. Res., 1912, XXVI, 46.
- Scott. Vet. Journ. LXVII (N. S. XVIII), 1911, 547.
- Seddon, H. P. Vet. Journ., 1916, LXXII, (N. S. XXIII), 46.
- Spreull, A. Sr. Vet. News. Abst. Journ. Am. Vet. Med. Assoc., 1918, V, 346.
- Szilly, von A. Arch. Micros. Anat., 1911, LXXVII, 87.
- Taylor. Vet. Record., 1916, XXIX, 248.
- Wooldridge. Vet. Journ., 1908, LXV (N. S. XVI), 454.
- Young. Vet. Record., XXIII, 706.
- Ziegler, E. General Pathology, 1908, 11th Ed. 405 and 433.

(To be Continued.)

RELATIONSHIP BETWEEN THE VETERINARIAN AND THE COUNTY AGENT.*

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Since the establishment of the policy of forwarding the county agent movement by the agricultural colleges of the several States and the United States Department of Agriculture, and indeed before such a movement was initiated, questions have constantly arisen as to the relationship of the various staff members, as employed by the colleges and Department of Agriculture, to members of the various professions or business enterprises within the several states. It is not surprising that questions

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have arisen. A new movement which has for its purpose the education of the people of a commonwealth must affect, to some degree, business enterprises or professions carried on by individuals. Questions that arise are not inherently difficult, but are complicated by the fact that persons may sometimes feel that their interests are seriously affected by certain phases of educational propaganda. To determine the relationship between the veterinarian and a member of any other profession or business and a county agent or member of the staff of an agricultural college, it is necessary to understand the ideals that have dominated the colleges and Department of Agriculture.

The agricultural college, as developed in the several states, is peculiarly an institution for service. It has been established, and its several branches of work developed for the purpose of enlarging the fund of information available in the agricultural field, and to further develop the application of such knowledge. This statement, to a degree at least, will also apply to the Department of Agriculture. The functions and activities of the two organizations, namely, the college of agriculture and the Department of Agriculture, are interwoven to such an extent that the greatest number of the employees in the state are also the joint representatives of the Department of Agriculture, and hence represent the two institutions.

The legislative acts establishing the experiment station, which is a division of the agricultural college, specifically appropriate certain funds through the Federal Government, and prescribe "that it shall be the object and duty of said experiment stations * * * to conduct research * * * bearing directly on the agricultural industry." It is further prescribed that this information shall be available to the citizens of the state. Later, the so-called Adams Act appropriated sums from the Federal Government made to experiment stations to further research and experiment bearing directly on the agricultural industry of the United States. Following these appropriations, an era of activity, research and experimental work has developed in the various stations, many contributions to the various fields of agriculture have been made, comprising information from methods of maintenance of the soil to the treatment of certain animal diseases. For several years, during the development of experimental and research work, it has been found that the

placing of information before the people was insufficient to secure its rapid adoption, and that an educational force dealing directly with the application of fundamental knowledge to farm problems was necessary if we would bring about the rapid advance in agriculture that is advisable and necessary. Congress recognized the importance of making it possible to take direct to the farm and to the farm home all information along agricultural lines, and in 1914 passed the so-called Smith-Lever Act, which provides for coöperative extension work. It is under this act, and from funds appropriated by Congress, that the work of our extension division, county agents, specialists and others is carried on in this State. This act specifically states that "extension work shall consist of the giving of instruction and practical demonstration in agriculture and home economics to persons not attending or resident in such colleges in the several communities, and imparting to such persons information on such subjects through field demonstrations, publications and otherwise."

The field of agriculture and home economics covers practically everything which may affect the home or the farm. It naturally followed that when the Department of Agriculture and our agricultural colleges began to establish work under this act, through the county agents and specialists giving out various lines of information, it frequently affected, to an extent at least, certain enterprises that had been carried on by private citizens. To illustrate further: information in marketing, the necessity for grading and the proper handling of the wheat crop greatly developed the movement for coöperative farmers' elevators. The giving of information in carrying on the demonstrations as to methods of soil maintenance frequently affected the sale of certain classes of fertilizers. Similarly, the carrying of information to the farmer on the proper treatment of swine diseases and the use of hog cholera preventive serum, vaccination of cattle for blackleg with the necessary demonstrations that were conducted on the farm sometimes affected the practice of the veterinarian, with the result that in certain instances the veterinarian felt that the forces of the Federal Government and the states were combined to affect his profession. My own point of view is that the work of the county agent and of various federal employees bringing about a more general knowledge and use of the various

preventives, has done much to add to the practice of the veterinarian, and is being used to elevate his profession to a higher standard.

I have been told that in this State, questions have at times arisen as to the place of the county agent and as to the advisability of permitting him to demonstrate certain preventives and to give advice in certain phases of sanitation, animal disease work, etc. It is not the policy of the agricultural college through its extension division to permit the county agent, specialist or any member of its staff to compete with the veterinarian.

County agents have always been instructed that their work must be strictly educational, and that they should not in any way attempt phases of commercial work, nor should they lay themselves open to such criticism. However, the county agent is placed in a county to demonstrate to farmers every phase of information that may be of value to them. Farmers were advised that they could make use of anti-hog cholera serum and an act which was passed by the legislature required the Experiment Station to supply them with serum at 1 cent per cc. It naturally followed that when the county agent work was first started one of the first great problems attacked by the county agent was the loss from hog cholera. At that time very few farmers in the state believed in vaccination. It was, therefore, necessary for agents to carry on a tremendous number of demonstrations to show that this was an efficient method of disease control. I am pleased to say that in a few years, largely through the work of the county agent and of the staff of the Live Stock Sanitary Board, the opinion of the farmers as to the advisability of controlling this disease has been largely changed. Following this development of work in the state, county agents were instructed to teach farmers the value of the use of serum and to confine their activities to demonstrations to farmers where the farmers were unacquainted with the value of this treatment. As matters stand at the present time, when the county agents learn of an outbreak of a disease of any character, they inform the state veterinarian, and if they consider it advisable, also inform the extension veterinarian employed at the Agricultural College. One or the other of the organizations named offers assistance. Since the passage of the live stock sanitary bill this assistance

has largely been given through the Live Stock Sanitary Board or the state veterinarian.

I have stated the present policy and its development somewhat in detail with the hope that it may tend to eliminate some causes of misunderstanding. Perhaps the greatest source of misunderstanding, especially in regard to disease control on the part of the veterinarian, has usually arisen in cases of small farmers living some distance from town and owning but few hogs. Three or four hogs to this man are of as great importance as the one hundred hogs that may be owned by a more fortunate neighbor. When threatened with cholera, it is impractical for this man to pay the necessary mileage services of a veterinarian. He wishes to avail himself of the services of the county agent or of a neighbor who may be competent to administer the serum; and in this, either the agent or neighbor is very glad to be of assistance to him. This, however, represents a class of business that can in no sense of the word affect the practitioner. The same action will hold true in cases of blackleg and similar diseases that may be controlled, with information for such control readily available. It is my opinion that the development of county agent work has practically increased the prosperity of the practicing veterinarian. It has developed an interest in better grades and classes of live stock and more knowledge on the part of the farmer of the possibilities of preventive sanitation and the necessity for the proper maintenance of his animals. Consequently, he has been ready to avail himself of the services of the veterinarian, when in former years he did not consider it worth while. If the veterinarians of the state will participate in this forward movement, have a vision of its possibilities and rise to the occasion, they will find that a better agriculture and its rapid development is an aid in their business.

In conclusion, I wish to say that the work of our extension division in the Agricultural College is wholly educational. We do not administer regulatory measures. Our men are instructed, however, to give instruction as to methods of control of animal diseases that become epidemic. They may give lectures and demonstrations on the use of serum and are required to give information regarding the rules and regulations of the Live Stock Sanitary Board. When necessary, they organize the farmers for educational purposes in the control of disease.

It is the desire of the College that most friendly relationships shall exist between our agents, specialists, members of our staff and the representatives of the various professions and businesses in the state. We believe that our policies will assist in building up all legitimate industries and professions. Where questions arise, we are desirous of settling the problems in a manner that will appeal to all as just, or at least of presenting our point of view to the members of the profession that may feel aggrieved. We ask that you shall call upon us for help and assistance in your problems.

TYPHLITIS AND PERITYPHLITIS.

By OSCAR SCHRECK,
New Haven, Conn.

It is my intention in this paper to describe as far as possible a disease involving the cecum, and its loose connective tissue, and termed Typhlitis and Perityphlitis. I intend to direct your attention to a malady which affects and destroys small animal life to a far greater extent than some are aware, and which has been treated under many different designations. In support of this observation on my part, of which very little is found in our veterinary journals, or text books, I here allude to this subject on that account. Until you have met with a typical case, and perhaps been deceived by it, you will hardly believe how easily you might be led into making a false diagnosis. I will now proceed to discuss its etiology, symptoms, morbid anatomy, and treatment, as used and proved by me in such cases.

SYNONYMS: Catarrh of the cecum.

DEFINITION: The term typhlitis is restricted to an inflammation of the cecum, and perityphlitis as an inflammation of the loose connective tissue surrounding the cecum, occurring in the acute and chronic forms. Sometimes called also "Cæcitis," and accompanied in most cases by ulceration. It may be divided into Catarrhal, Ulcerative, and Interstitial forms, and is rarely of spontaneous origin.

ETIOLOGY: Standing clinically in close connection with inflammatory affections of the peritoneum, are disorders of the cecum and its surrounding tissues. The anatomical position of the pouch as a receptacle for the small intestines, the arrange-

ment of its muscular elements, and its abundant mucous folds, when empty, are properties necessary to its function, and at the same time causes disease of this organ of the small animals. There are also other special conditions affecting the cecum.

It may originate in the loose areolar tissue around the cecum; it may start in the cecum and spread from its peritoneal covering to the areolar tissue of the iliac fossa. Inflammation of the cecum in the small animals, however, is in the majority of instances caused by the accumulation of hardened feces, or in some cases by foreign bodies which have become impacted, from the size of a pea to a peach stone, which are sometimes of a waxy consistence and lustre, and for the most part fecal, and the secretions from the mucous surface. They may be multiple and may be present a long time without producing any noticeable harmful effect, the animal dying from other causes. The writer has in mind a case of typhloitis in a pointer with a fatal ending. Post mortem revealed sand and cement impacted in the cecum; and on further investigation found, in the yard to the rear of the factory next door, a mortar bed that had been in use a number of weeks, and learned that the animal had been seen drinking daily from this mortar bed. Hence the cause and the resultant findings. The same is true of foreign bodies, which do, of course, occur and include objects to be mentioned later, as causative factors. It may also be due to extension from neighboring parts, and by extreme distention of the cecum, resulting in atony of the intestine, and thus allow a large fecal accumulation that may be followed by ulceration of both the mucous and sub-mucous tissue. In some cases the perforation is in that portion of the bowel which is devoid of peritoneal covering. Fecal matter then escapes into the surrounding tissues, leading to more or less extensive inflammation and induration, and probably also the formation of an abscess. If the escape be but small in quantity, inflammatory swelling may alone take place, and after a while subside. The most frequent form of fatal typhloitis is no doubt that which results from perforation. An extension of the inflammation to the sub-mucous layer occasionally takes place, the connective tissue undergoes hyperplasia, a permanent increase of thickness results, and stenosis is an ultimate effect of the changes. It is only in the chronic form that such thickening and stenosis can occur. It is also due to

mechanical effects of bristles, pins, bones, wood, etc., which have been swallowed, or to the lodgment of intestinal concretions. Also the result of intestinal catarrh.

The cases which succeed the catarrhal or ulcerative form are, of course, characterized by the loss of tissue corresponding to the extent of the disease. As a predisposing cause must be considered certain influences, also, which were formerly regarded as exciting; such as overeating or overfeeding of the animal, especially of unwholesome or indigestible food; or gastric diseases from any cause, in addition to the foreign bodies and concretions already mentioned. Just how this takes place, however, is at present unknown. It may be from hyperemia or delayed circulation, similar to traumatic causes. More cases seem to occur during summer than in winter.

MORBID ANATOMY: Catarrh of the cecum may exist as a mere catarrhal affection of the mucous membrane, which soon involves the sub-mucous tissue, and when catarrh of the cecum exists, especially the chronic form, the hyperæmia and swelling are more decided in the neighborhood of the orifice. If general peritonitis supervene, there is added the usual anatomical appearances incident to this condition. The duration of typhlitis is necessarily very uncertain. Sometimes the animal speedily recovers and sometimes lingers.

SYMPTOMS: The symptoms of typhlitis are, in the first instance, pain, tenderness and swelling in the region of the cecum, together with signs of inflammatory fever and sometimes rigors. Sometimes the pain will be dull or of a distinct colicky character. Constipation is not infrequently present during the early period of the disease; while diarrhœa is apt to supervene at a later stage. But none of these symptoms has any particular uniformity of value; still I may say that constipation in a decided majority of cases from the beginning of the attack is present and diarrhœa often alternating with the constipation. In mild cases, uneasiness of the animal, followed by pain on palpation, and tenderness found to exist in the region just anterior to the crest of the ilium. The more decided the pressure, the more distinct the pain. Additional symptoms will be noticed when the animal is held erect, or straightened out, (standing on its hind legs). Inflammation of the loose areolar tissue around the cecum presents much the same symptoms and signs. This

perityphloitis is, in truth, frequently combined with inflammation of the cecum. Even where perforation has taken place, the matters may be retained in the neighborhood of the lesion, giving rise to circumscribed inflammation around the cecum, and to an abscess. Subsequently, the collection of pus may find its way into neighboring viscera or be discharged externally, when the ruptured intestine may heal; although sometimes the perforation remains open, and fecal matter is found oozing through the abdominal parietes. Vomiting is a symptom of more or less frequency. It is commonly regarded as reflex and at times is very severe. The matter vomited is first the gastric contents, with the evacuation of which the vomiting usually ceases. If the symptom is more prolonged, the vomited matter becomes greenish, and called bilious. The urine is scanty, as is usual in febrile conditions, and there is often an irritable bladder and frequent micturition. The expression of the animal varies with the severity of the symptoms, but seldom exhibits the anxiousness characteristic of peritonitis, unless the latter actually is present in consequence of perforation or rupture of abscess. As has been stated, there is always fever at the onset, the temperature 102. 103 F. and even 104 F., rarely higher in the dog, but may be seen higher in the cat. As a rule the pulse rate corresponds with the temperature, but its force and volume vary with the animal's strength. Should suppuration take place, the temperature continues with but a slight fall, or may in some cases rise higher. A sudden fall of temperature does not always mean the establishment of convalescence. Not very rarely the event has a widely different meaning. It means that, instead of convalescence, perforation has taken place. And it is extremely important that this fact should be realized. The functions of the alimentary canal are by no means necessarily disturbed to any great extent and is very important in diagnosis.

PROGNOSIS: In the simple form the prognosis in many cases is favorable; in the severe form it is grave, although recovery will ensue in a large proportion of the cases if the management is judicious. In the chronic form, when the connective tissue has become thickened, the prognosis as to cure is unfavorable. And in many cases in which the peritonitis is localized and intestinal perforation does not occur, recovery takes place.

TREATMENT: The treatment of typhlitis is in principle, and indeed in most of its details, the same as that of enteritis and other forms of ulceration of the bowels. It consists mainly in keeping the bowels quiet, which I know is contrary to the teaching of some, yet nevertheless I consider it of very great importance in the treatment of this disease. It consists mainly in keeping the bowels quiet by the aid of opium in some of its forms or derivatives, and in the employment of local applications. I wish to state it is almost more important in typhlitis than in any other affection to avoid the use of what is called by some opening medicines. If the bowels need to be relieved simple enemata are the safest means for the purpose, and usually are sufficient. When free movement is obtained in this manner the canal should be kept quiet with opium for a few days. Different cases require different treatment, and in fact must be treated by the symptoms shown. The animal should be kept thoroughly under the influence of the narcotic. Morphine has answered as the best line of treatment from the writer's observations. It is better to combine atropine with the morphine, for greater security and increased therapeutical power. No absolute rule for quantity can be laid down, and I must say these kinds of cases will stand very large doses, but the decided effects of the morphine, as shown in the state of pupil, pulse, respirations, and the somnolence, should be steadily maintained. The fullest curative power of morphine is obtained from a quantity strictly within the limits of safety, and hence no risk need be had to obtain the best results. As a guide to the administration, it may be stated that one-fourth of a grain of morphine and $1/120$ grain of atropine is enough for the first dose in a medium-sized dog. Of course the smaller the animal, the smaller the dose, and subsequently one-eighth grain of morphine and $1/200$ grain of atropine every four, six or eight hours according to the effect.

If for any reason the hypodermic administration of morphine is not carried out, the next best mode is the rectal injection of the tincture of opium, and in fact, in some cases answers the object sought with the best results. As regards the quantity, the rule above given is proper; it is the degree and constancy of the effect which determine the amount, also the kind or breed of animal. If for any reason the rectal injection is objected to, or the organ is intolerant, as sometimes happens, the drug may be

administered by way of the stomach. Under this mode, especially the cat, the best preparation is the deodorized tincture, and to secure uniformity in action the preparation after an essay of the opium is altogether preferable by the writer. This corresponds in strength to laudanum: fifteen to twenty drops to the cat and small animals, while thirty to sixty drops to the larger animals may be the first dose and half the above amounts every two, three, or four hours succeeding, the quantity to be determined by the effect as already stated. This line of treatment with opium is best continued until the bowels are moved spontaneously or till the inflammation, temperature, and pain on palpation, subsides. The effects may be retained for several days; the writer has maintained the effects for ten days, with a complete recovery. As soon as the tenderness subsides, a saline laxative may be given, in a most cautious way. The most efficient and at the same time safe laxative is the old reliable sulphate of magnesia; and let me here state that you will find that this salt will be retained when other medicines are rejected by vomiting. If the vomiting is persistent, it may be relieved by milk and lime water (say three parts to one), also pellets of ice to lap, etc., but as a rule when the hypodermic injection is practiced vomiting is a more less pronounced symptom in many cases, excepting the cat and very small lap dogs. Good effects are also obtained from counter irritation by fomentations or diluted turpentine stupes, and hot bandages, when hot applications seem to be indicated by the attending veterinarian.

According to the writer's observation, however, in these cases, the external application of ice cold compresses is more efficient than warm applications. Iced stupes are often exceptionally responsive to your expectations and results, because it is converted into steam and rapidly conveys away extra heat, and also diminishes the quantity of blood in the vessels of the part. When doubt as to the diagnosis exists as to whether there is true Typhloitis or Perityphloitis, or painful distension of the bowels, turpentine may be administered with small doses of strychnine, say $1/60$ to $1/200$ grain; while turpentine may be applied iced locally. Do not give the animal under treatment turpentine enemas under any circumstances, as it may do more harm than good. Special symptoms such as vomiting, faintness, exhaustion, etc., require the treatment usually appropriate to con-

trol them. For the first, ice by the mouth and locally (externally) are useful; for failing strength of the animal, stimulants, local heat, hypodermic injections of strychnine, digitalis, etc., are valuable. Those animals which have suffered once from the affection are very liable to have a recurrence of the disease, and require care as to diet, exposure to cold, and other conditions likely to act injuriously. If the above outlined treatment fails to give the desired results, recourse may be had to the operation of laparotomy, but no rule can be laid down to meet all cases, that will aid in the selection of the proper time.

INSPECTIONS FOR INTERSTATE MOVEMENT OF LIVE STOCK.*

By J. S. GROVE,
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The inspection of live stock for interstate movement is a considerable part of the work of many veterinarians, especially those who are situated near the main lines of travel which lead to state boundaries. This service is essential because of Federal and state requirements governing the admission of live stock.

These requirements, which vary considerably, are imposed to prevent the spread or introduction of contagious diseases, such as glanders, cattle or sheep scabies, Texas fever, tuberculosis, hog cholera, foot and mouth disease, etc.

Inspections are also necessary to locate the origin of disease, in order that infected territory may be properly quarantined or policed.

It is, or should be, the universal custom to notify the proper Federal and state authorities whenever any contagious disease is found, either in transit or at the time of slaughter, so that all outbreaks may be promptly suppressed, thereby preventing the introduction of disease into uninfected districts and preventing losses which would be sure to occur in the absence of authoritative action to prevent the spread of contagion.

The business interests of the country at large expect and are entitled to protection from the losses resulting from animal plagues.

* Paper presented at meeting of Oklahoma State Vet. Med. Ass'n., June 30 and July 1, 1919.

The proper control of disease has a marked effect in the stabilization of values and the preservation of our live stock markets. Uncontrolled disease means uncontrolled markets and financial disaster to a countless number of people.

Some districts frequently find themselves overloaded with certain classes of live stock, while in others, perhaps a considerable distance away, there will be a shortage of such classes of stock and it is essential that facilities be provided and that the routes be kept clean for such interstate movements. Thus, in the state of Wisconsin, there is usually a surplus of dairy animals, while in parts of Texas there may be a surplus of unfinished beef cattle and the ways must be kept open to move the surplus to points where it can be utilized or finished for market.

Likewise, during recent years we have witnessed the remarkable growth of the stock hog business, which is based on efficient veterinary inspection and immunization of the animals. There always appears to be a surplus of immature swine in Arkansas, eastern Texas and eastern Oklahoma and the proper inspection and handling of these animals is essential to the protection of the interests involved.

We sometimes hear of objections to having regulations governing the movement of live stock. These may be classed under three heads, as follows:

1. Trouble or annoyance;
2. Expense;
3. Perfunctory or worthless inspections.

Regarding the first objection, it must be admitted that, especially in this state, it is somewhat annoying to send long distances for a qualified inspector, especially when the owner is practically certain that no disease will be found. This objection will be gradually overcome as the country becomes more thickly settled and competent practitioners more numerous.

The matter of expense is always an objection, especially to persons who have little or no conception of the reasons for quarantine regulations and the vast volume of business involved. The expense can sometimes be lessened by having inspections made en route.

Practitioners should make their charges reasonable and be able to explain that while no disease may be found, it is only by

the exercise of ceaseless vigilance, by veterinarians everywhere, that outbreaks of disease are discovered at the start and that control is thereby made possible; and while the expense is a burden, it is by the exercise of such vigilance that your clients' herds have been protected from disease.

It is not many years since many of our states were quarantined on account of sheep and cattle scabies, but these quarantines have nearly all been lifted, as the result of constant and careful inspections and treatments.

While the payment of a fee may be a hardship, it is a small matter as compared to the loss which would result from uncontrolled epizootics.

Perfunctory or worthless inspections are acts which bring the profession into more or less disrepute.

We hear of various shortcomings in this respect, such as neglect to take sanitary precautions when testing or vaccinating, writing certificates without seeing the animals, neglect to take the required number of temperatures and neglect to take temperatures at proper times, lack of information regarding state requirements and improperly prepared certificates.

It is not uncommon to find certificates which are only partially filled out so that one is unable to tell whether the inspector was certifying to horses or cattle. Each inspection should include:

1. A careful physical examination of the animal with a view to detecting communicable disease, such as glanders, tuberculosis, hog cholera, scabies, Texas fever.
2. Whenever a tuberculin or other test is required by the state to which the stock is destined, or by Federal regulations, such test should be properly made, although as sometimes occurs, the owner wants only the certificate and not the inspection.
3. Certificates should carry an accurate description of the animals. Note the breed, age, color, markings, brands, tattoo marks, whether polled, horned or dehorned, scars or blemishes. Make the description as definite as possible, so that the certificate will apply to one animal only. Do not describe an animal simply as "One Holstein Cow," but try to find some additional characteristics, so that a stranger could select the animal which is being certified.

Where a number of animals are consigned to a sale it would save the owner some annoyance if a separate certificate be made for each animal so that the certificate can go with the animal to its final destination.

Instruct shippers and railroad men to attach the certificate to the waybill which accompanies the stock.

We sometimes examine waybills which bear the notation, "Health certificate on file." A certificate which does not accompany the animal is useless.

In case of doubt as to state requirements get the necessary information from the various state live stock sanitary officials by mail or wire as may be necessary.

Always remember that it never pays to make a false or misleading certificate. The client who requests you to insert a false temperature record will be among the first to condemn you or your fellows whenever a question of professional integrity is involved.

Shipments of horses and mules for Canada must be given the mallein test by a veterinarian registered with the Bureau of Animal Industry. There are only five or six such parties in this state. Shipments of cattle for Canada must be accompanied by a B. A. I. certificate and tuberculin test chart. Neglect to observe this may delay the stock at the Canadian border for an indefinite time.

Effective July 1, 1919, regulation 7 to B. A. I. Order 263 becomes operative. This regulation requires that all cows and bulls intended for breeding purposes, except strictly range cattle, shall pass the tuberculin test before moving interstate.

Cows for feeding and grazing purposes and bulls for feeding purposes may be moved interstate without the tuberculin test, provided the owner or shipper will furnish an affidavit to the Bureau representative at a public stock yards, showing that the cattle are for feeding or grazing purposes only; however, such cattle can be shipped only to states the laws or regulations of which provide for the quarantine of such cattle through the feeding or grazing period and for their release only on written permit by the proper regulatory authorities.

Heifers (female cattle under 3 years of age and which have not given birth to young) shall not be moved interstate without

the test until the shipper certifies that they will be used only for feeding or grazing purposes.

Cattle consigned to a public stock yard, steers and strictly range cattle, may be moved without restriction.

Reactors may be shipped interstate for slaughter under Bureau supervision, but such cattle must be branded with the letter "T" on the left jaw or the letter "T" punched in the left ear or a B. A. I. "reactor" tag applied, and such cattle must not be loaded with healthy stock, unless the latter are for immediate slaughter only. Waybills must be properly marked and cars disinfected.

It is believed that the enforcement of this regulation will be a great aid in preventing infection and will be the means of locating infected herds. It is hoped that the practicing veterinarians will willingly cooperate in the enforcement of this regulation and it is apparent that their services will be required in an ever increasing measure as the work becomes better understood.

Your attention is directed to that part of the new regulation which states that when the cattle are destined to a state which recognizes the intradermal test the test chart shall show that the cattle have been observed at the end of the seventy-second hour and found free from any symptoms of tuberculosis.

When the subcutaneous method is used the chart shall show that at least 3 temperatures were taken 2 or 3 hours apart before injection of the tuberculin and that at least 7 temperatures were taken 2 hours apart after injection, beginning not later than 8 hours after the injection, and that the test ran for a period of not less than 20 hours after the injection.

In the case of cattle which are known to have been frequently injected with tuberculin the post temperatures should begin four hours after the injection.

It is the intention of the Bureau to recognize the tests which are made by practicing veterinarians, so long as they are properly made; and it is hoped that it will not be necessary to report any irregularities.

Dr. T. S. Leith, formerly of Ames, Iowa, is now located at Americus, Ga.

STUDIES ON ANTHELMINTICS.

V. THE ADMINISTRATION OF OIL OF CHENOPODIUM IN SOFT, OR SOLUBLE ELASTIC, GELATINE CAPSULES, AS COMPARED WITH OTHER MODES OF ADMINISTRATION.

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Two of the very evident advantages afforded by the use of soft gelatine capsules are these: They furnish a convenient measured dose, and they supply a capsule with the advantages of the hard capsules (tastelessness), plus the advantage of saving bulk and bother, by combining the drug and the capsule, and the assurance that the capsule will not open in the mouth, pharynx or esophagus. They have proven entirely satisfactory in the administration of oil of chenopodium to experiment animals in our work here and have been recommended by one of us (Hall, 1917) for use in treating dogs.

The soft capsule, however, has recently been criticized as a container for oil of chenopodium, in a paper by Darling, Barber and Hacker (1918). They state that 3 10-minim doses of oil of chenopodium in soft capsules at hour intervals only removed 66.4 per cent of the hookworms from patients, as compared with the removal of 97.9 per cent of the worms by the same oil when removed from the capsule and then administered in freshly filled hard capsules. By way of explanation they state; "The soft capsules dissolved too slowly to permit their contents to affect the hookworms distributed in the duodenum and the upper part of the jejunum." Undoubtedly, this explanation is intended only as a plausible surmise. If the soft capsule digests or opens in the middle of the jejunum, it undoubtedly misses worms in the upper jejunum and duodenum, but there is some question as to whether it leaves the stomach unopened.

There are several ways of judging whether the soft capsule actually opens in the jejunum or in the stomach. One way is to determine the anthelmintic efficacy of chenopodium exhibited in the soft capsule and compare it with the efficacy of chenopodium exhibited in the hard capsules. Another way is to administer the soft capsules to dogs and kill the dogs after various intervals. We have here data of both sorts and these data do not sustain

the attitude taken by the writers quoted. So far as the application of findings in animal experiments to similar conditions in man is concerned, one must undoubtedly make the application with much care and some reservations. It is therefore impossible to insist too strongly that what we find true in the case of dogs is also true in the case of man, especially when the writers quoted find to the contrary. At the same time, there is something to be said for our experimental findings.

In the first place, our experimental findings are exact and definite, covering treatment, exact number of worms passed for the 4 or more days after the administration of the anthelmintic and up to the day of death of the animal, and the exact number of worms found post mortem. There can be no question but what the information obtained in this way is more exact than that obtained clinically and by examining the feces for parasite eggs, which method must be depended on by physicians working with human patients.

In the second place, hundreds of experiments show that the ascarid of the dog has a quite definite and dependable reaction to chenopodium, as Hall (1918) has noted, whereas hookworms in man or dogs have no such dependable reaction to any drugs, part of them yielding to one treatment and part quite commonly yielding only after 2 to 5 or more treatments. In judging, therefore, the fate of soft capsules of chenopodium, their results in the shape of ascarids removed from the dogs is a surer guide than that in the shape of hookworms removed from man and subsequent fecal examinations for eggs.

Finally, we have made a number of tests in the way of killing dogs at an interval after administering chenopodium in soft capsules and in other ways, and these tests show that the soft capsule does not wait until it reaches some point in the intestine before opening, but opens in the stomach. In this respect, our findings agree with the fact that our critical tests show that soft capsules of chenopodium display as high anthelmintic efficacy against ascarids as do doses of the drug in hard capsules or in castor oil. We have data on 220 dogs that have been given oil of chenopodium or its derivatives, alone or in combination with other anthelmintics, in castor oil, hard or soft capsules, or undiluted and without capsule, with records of all worms passed and worms present post mortem, and these experiments all testify

to the ascaricidal efficacy of chenopodium and bear out the statement that it is as effective when given in the soft capsule as when given in the hard capsule or any other way.

In this series of 220 dogs, there are only 8 that were given chenopodium in soft capsule, followed immediately with castor oil and not complicated by other considerations (enteric coats, other drugs, repeated doses involving more than 1 day, etc.) and these 8 dogs may be compared with the animals treated by Hall and Foster (1918). These writers gave chenopodium at the rate of 0.3 m. p. k. (mil per kilo) in castor oil to 8 dogs and removed 160 ascarids out of 162, an efficacy of about 99 per cent; they gave chenopodium in hard capsules at the rate of 0.2 m. p. k. with olive oil and castor oil on 3 successive days to 8 dogs and removed 15 out of 17 ascarids, an efficacy of 88 per cent. In our 8 experiment dogs, all of which were infested with ascarids, 4 dogs received the therapeutic dose of 0.1 m. p. k., 1 received a lethal dose of 1.0 m. p. k. with castor oil for protection, and 3 received doses between 0.1 and 0.2 m. p. k., all in soft capsules. These dogs passed 87 out of 87 ascarids, an efficacy of 100 per cent. In spite of the larger doses used by Hall and Foster, the efficacy secured by larger doses with their mode of administration is slightly inferior to that secured with smaller doses in soft capsules. They report that the dogs in the first series noted above had about one-fourth of their hookworms removed, and in the second series the treatment was ineffective for hookworm. In our series of dogs, 7 had hookworm; the treatment with soft capsules removed 23 out of 31, an efficacy of 74 per cent. In a series of 4 dogs treated by us with single doses of chenopodium, not in soft capsules, at the rate of 0.1 m. p. k. the treatment removed 10 of 10 ascarids, and none of 16 hookworms from 2 dogs; at a higher rate it removed 5 of 5 ascarids from 2 dogs.

So far as anthelmintic efficacy is concerned, accurate critical tests on both ascarids, a dependable form for test, and hookworms, a less dependable form, show that if there is any choice between the administration of oil of chenopodium in soft capsules or hard capsules or in castor oil or olive oil, the choice would lie with the soft capsules.

As regards the time and place of opening of the soft capsule in the digestive tract, a series of experiments was performed to furnish information on this point. The first set of tests were

with the soft capsules; the second set were with chenopodium administered in oil.

The first set of tests using the soft capsules may be summarized as follows:

Without purgative.

Dog No.	Capsules.	Dog killed.	Result, capsules.	Digestive tract.	Remarks.
251	3 5-minim	26 min.	In stomach; unopened.	Normal.	Food in stomach.
252	2 5-minim	42 min.	In stomach; unopened.	Normal.	Food in stomach.
253	3 5-minim	1 hr., 2 min.	In stomach; 1 opened, 1 cracked, 1 softened.	Normal.	Food in stomach.
254	3 5-minim	1 hr., 21 min.	In stomach; unopened.	Normal.	
354	3 5-minim	1 hr., 30 min.	Digested; chen. odor in stomach and small int.	Petechiæ in stomach and small int.	
348	3 5-minim	2 hrs.	Digested; chen. odor in stomach.	Normal.	Food in stomach.
331	3 5-minim	2 hrs., 46 min.	Digested.	Gas. int. hem.	

With purgative.

(These dogs all received 3 5-minim capsules and the purgative shown.)

Dog No.	Purgative.	Dog killed.	Result, capsules.	Digestive tract.	Remarks.
328	Ol. ric. 30 mls	30 min.	Digested; chen. odor and ol. ric. near ileocecal valve.	Mild hyperemia.	
355	Cascarin 2 grs.	30 min.	In stomach; open and half digested.	Gast. int. petechiæ.	
329	Ol. ric. 30 mls	1 hr.	Digested. Chen. and ol. ric. in stomach.	Normal.	
349	Calomel 2	1 hr.	Digested. Chen. odor in stomach.	Inflam. and hem.	Dog vomited fragments of capsule.
330	Ol. ric. 30 min.	2 hrs., 4 min.	Digested. Oil in large int.	Normal.	1 asc. pres. in large int.

It will be noted from an examination of the above tables, that when the soft capsules were given *without purgatives*, they were recovered from the stomach unopened as late as 1 hour and 21 minutes after administration; they were found opened in the stomach as early as 1 hour and 2 minutes after administration; and they were entirely digested at intervals of 1 hour and 30 minutes to 2 hours and 46 minutes. It appears, then, that soft capsules given without purgation will open in the stomach, and probably open from 1 to 2 hours after administration. This coincides with the time of onset of symptoms of salivation and vomiting in animals given chenopodium in soft capsules, where these symptoms appear. Chenopodium could be found in the

small intestine as early as 1 hour and 30 minutes after administration.

Where the soft capsules were given *with purgatives*, the time of opening in the stomach was materially shortened. As early as a half hour after administration, and after all longer periods, the capsules were partly or entirely digested, and chenopodium was detected near the ileocecal valve in 30 minutes in one instance.

It will be noted that in no cases were capsules found unopened in the intestine. When they were found at all, they were in the stomach: here they were found unopened, open, and partly digested: here the oil of chenopodium could be detected in almost all cases, as late as an hour after administration in the case of capsules given with purgatives, and as late as 2 hours after administration in the case of capsules given without purgatives.

Not only does all the evidence point to the opening of the capsule in the stomach, but other considerations sustain this idea. The soft gelatine capsule becomes very much softened by exposure to the moisture of the digestive fluids of the stomach, not to mention the digesting action of these fluids. Such softened capsules break very easily on pressure, and it seems likely that the pressure applied at the pylorus would break these capsules if they started to pass unopened. Possibly the early opening of capsules given with purgatives is due to increased gastric peristalsis and prompt rupture of the softened capsule, with digestion of the capsule hastened as a result. It is also possible that the purgative stimulates secretion of the digestive fluids.

Following up the foregoing experiments, some tests were made to ascertain the fate of oil of chenopodium given without capsule of any sort, with and without purgatives. To aid in following the course of the chenopodium, it was mixed with Eaton's fat-soluble blue. The doses were at the rate of 0.1 m. p. k.

Without purgative.

Dog No.	Dog killed.	Oil found.	Digestive tract.	Remarks.
318	47 min.	In stomach.	Normal.	
321	1 hr., 4 min.	In stomach and small intestine.	Petechiæ in pyloric stomach; pylorus and duodenum hyperemic.	
319	1 hr., 45 min.	In stomach.	Normal.	

With purgation.

320	32 min.	In stomach.	Normal.	30 mls ol. ric.
322	1 hr., 4 min.	In stomach.	Normal.	30 mls ol. ric.
351	1 hr., 30 min.	In stomach.	Gast. hem., small int. hyperemic.	2 grs. cascarn. 1 asc. in int., ap- parently dead.
357	2 hrs.	In stomach.	Normal.	2 grs. cascarn.
352	2 hrs., 7 min.	In stomach.	Few hem. in int.	2 grs. calomel. 2 asc. in int., apparently dead. Fed before dosing. Vomited in hr. after dosing.
323	This dog was given the chenopodium with oil-soluble blue and 30 mls of castor oil, and 29½ hours later the dose was repeated, this time with oil-soluble orange instead of blue. The dog was killed 2 hours and 12 minutes later. The orange-colored chenopodium was found in the ileum; there was no trace of the blue-colored chenopodium given the previous day. The ileum was mildly hyperemic.			

In view of the fact that small amounts of oil, such as would slowly pass the pylorus, cannot readily be detected even when the fat-soluble coloring matter is used, one cannot affirm much as to where chenopodium was not present; one can only make affirmation as to where it was present. From the experiments tabulated above, we find that chenopodium given without purgatives or the use of capsules may still be present in the stomach 1 hour and 45 minutes after administration; when given with purgatives, without the use of capsules, it may still be present in the stomach 2 hours and 7 minutes later. We also find that even without purgatives, the oil may be in the small intestine in 1 hour and 4 minutes, and with purgation it may be in the ileum 2 hours and 12 minutes after administration, and the evidence of an apparently dead ascarid indicates that it may be there in an hour and a half. Doubtless it is in the small intestine earlier, as the experiments with capsules show.

The fact that the chenopodium in soft capsules, given with castor oil, may rapidly get to the small intestine, is perhaps due to the fact that the castor oil can exert its action at the start, unimpaired by the constipating chenopodium in initiating peristalsis.

The slowness with which the oil leaves the stomach confirms the position taken by Hall (1918) to the effect that anthelmintics, at least some anthelmintics, probably do not need to be allowed "time to act" on the worms before purgatives are administered. In this connection, Hall states:

"It is so generally believed and stated that anthelmintics should be allowed time to take effect before any purgation is attempted, that it seems almost unsafe to dispute the proposi-

tion. Dock and Bass even explain the failure of remedies to act effectively as possibly due to 'the rapid carrying down of the thymol by peristalsis to below the location of the worms', even in the absence of purgation. My own experiences have led me to fear more the absorption of the drug in the stomach before reaching the site of the worms. In over two years' experiment work, involving the treatment and post mortem examination of over 250 dogs, the results seem to be a little better, if anything, where the anthelmintic and the purgative are administered simultaneously than where the anthelmintic is allowed to precede the purgative by an hour or longer. Such combinations as oil of chenopodium and castor oil, chloroform and castor oil, santonin and calomel, etc., seem to be as effective as the ingredients of the combinations administered separately and at intervals. It is well known, of course, that such anthelmintics as areca nut are themselves purgative. Even if it were true that anthelmintics are more effective if purgation is postponed, and it can be shown that the patient is safer where the purgation is given with the anthelmintic, would it not be good practice to repeat a safe treatment oftener, rather than to give a less safe treatment fewer times?"

We are unable to reconcile the differences in the results obtained by Darling, Barber and Hacker and those obtained by us, as regards the value of the soft gelatine capsule of chenopodium, but we have no adverse comment to make on their results. We merely state our own results and indicate that there is a disagreement. There might have been some differences in the capsules used by them and the capsules used by us, and it might be that the capsules harden with age, though we have no evidence of our own on this point. The soft capsule can be hardened with formalin to the point where it will not digest, and there are other substances which will have the same effect.

Our findings further disagree with theirs on a number of other points which can only be mentioned here. For one thing, they found oil of chenopodium given in liquid petrolatum 88.7 per cent effective, while soft capsules were only 66.4 per cent effective, whereas we find that the use of liquid petrolatum cuts the anthelmintic efficacy, even against ascarids, to zero at times, while the soft capsules have an ascaricidal efficacy very close to 100 per cent. Experiments covering this point have

been published by Hall (1918) in a study by Hall and Hamilton (1918). Darling, Barber and Haeker state that "*Chenopodium* is relatively just as efficacious in removing *Ascaris*, *Clonorchis* and *Tænia*" as in removing hookworms. So far as the dog is concerned, hundreds of critical experiments show that chenopodium is unequaled for use against ascarids, and is a very inferior and undependable anthelmintic for use against *Tænia* and *Dipylidium*, removing them but rarely and showing no such efficacy as is shown by male fern or kamala. They prefer magnesium sulphate to castor oil as a purgative with chenopodium. This is a moot point which we will discuss in another paper.

CONCLUSIONS

On the basis of many experiments with dogs, we feel safe in saying that the following is true of dogs and that these findings apply in part to man:

1. The soft, or soluble elastic capsules of chenopodium open in the stomach and not in the small intestine.

2. The foregoing statement is sustained by the high ascari-cidal efficacy of the soft capsules of chenopodium, as well as by their efficacy against hookworms.

3. The administration of purgatives at the same time as the soft capsules, hastens the opening of the capsules. Without the purgatives, capsules lie in the stomach as long as 1 hour and 21 minutes, and apparently digest in 1 to 2 hours. With the purgatives, capsules are wholly or partly digested in 30 minutes. Without purgatives, chenopodium from the capsules may be detected in the intestines in 1 hour and 30 minutes. With purgatives, chenopodium may be detected in the intestines in 30 minutes.

4. The more rapid opening of capsules given with a purgative is probably due to the mechanical action of heightened peristalsis on the softened moist capsule and to increased secretion of digestive fluids as a result of stimulation by the purgative.

5. Given in soft capsules, chenopodium may stay in the stomach as long as 1 hour and 45 minutes if given without purgatives, or 2 hours and 7 minutes if given with purgatives; or may be detected in the small intestine in 1 hour and 4 minutes if given without purgatives, or in 1 hour and 30 minutes if given with purgatives. It is probably present in the small intestine earlier.

BIBLIOGRAPHY.

, Darling, Samuel T.; M. A. Barber; and H. P. Hacker. 1918. The treatment of hookworm infection. *J. Am. M. Assn.*, v. 70, Feb. 23, pp. 499-507.

Hall, Maurice C. 1917. Anthelmintic treatment for nematode infestations in dogs. *J. Am. Vet. M. Assn.*, v. 5 (3), pp. 342-345.

1918. A discussion of some principles of anthelmintic medication. *N. Orleans M. & Surg. J.*, v. 70 (8), Feb., pp. 637-653.

1918. The anthelmintic value of chenopodium components. *In Hall & Hamilton*, q. v., pp. 240-261.

Hall, Maurice C.; and Winthrop D. Foster. 1918. Efficacy of some anthelmintics. *J. Agric. Research*, v. 12 (7), Feb. 18, pp. 397-447, 1 fig.

Hall, Maurice C.; & Herbert C. Hamilton, 1918. Investigations on the composition of oil of chenopodium and the anthelmintic value of some of its components. *J. Pharm. & Exp. Therap.*, v. 11 (3), April, pp. 231-261.

**THE RELATIVE POTENCY OF TAIL BLED AND
CAROTID BLED ANTI-HOG CHOLERA SERUM.**

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It is quite generally agreed that after hogs have been hyperimmunized with hog cholera virus that the most potent anti-hog cholera serum is obtained if the animals are bled not sooner than ten days and not later than forty days from the date of hyperimmunization. The length of time which the circulating blood of such hyperimmunes retains its potency without the injection of additional antigen cannot be arbitrarily fixed since this has not been definitely ascertained. Some investigators have found that such blood is potent for several months. The experience of others indicates that potency is retained for more than a year even though the additional antigen be not given. The Bureau of Animal Industry of the United States Department of Agriculture regulates certain phases of this question in laboratories where anti-hog cholera serum is produced under United States Government License. Under Bureau regulations hyperimmune hogs may not be bled sooner than ten days nor later than thirty-eight days after hyperimmunization unless after that time the animal be rehyperimmunized. The same regulation requires

that such animals shall not be bled oftener than once each seven days.

It is not convenient to bleed swine from the larger blood vessels of the throat as is done in the case of most serum producing animals, unless the animal is to be bled to death. This is due to the fact that in swine these vessels are covered with heavy layers of fat and muscle.

Dorset, in his early work, found that the most satisfactory method of bleeding hogs, provided it was not desired that they be bled to death, was by severing the tail. He found that blood taken in this manner from the tails of hogs previously hyperimmunized in the proper manner was fully potent and would protect susceptible pigs against hog cholera.

This method, at first slow and cumbersome, was later improved by the use of a vacuum attachment which rapidly draws the required amount of blood from the exposed blood vessels.

After Dorset's discovery it was customary to bleed from the tail for a number of times after which the animals were bled to death from the carotid artery. Later, certain laboratories eliminated the tail bleeding and adopted the method of bleeding only from the carotid artery, the animals being bled to death. Those following this method have advanced claims of greater potency for serum obtained in this manner, at the same time maintaining that serum obtained from carotid bleeding preceded by tail bleeding has a lower potency and consequently a diminished protective value.

At the present time there are three methods of bleeding in general use:

1st. Carotid bleeding preceded by three tail bleedings seven days apart, all within a period of thirty-eight days from the date of hyperimmunization.

2nd. Carotid bleeding preceded by one tail bleeding seven days apart, both bleedings occurring within seventeen to twenty-one days from the date of hyperimmunization.

3rd. Carotid bleeding only. This is generally carried out from ten to fourteen days from the date of hyperimmunization.

A fourth method less frequently used consists of tail bleeding three or four times within thirty-eight days after which the animals are injected with more antigen and subjected to a second series of bleedings. Since each bleeding requires the sacrifice

of a section of the tail the animals are used until the caudal appendage has been entirely disposed of, after which they are bled to death.

Since the first two methods have been longer and in more general use than the third, and because of the claims presented by followers of the third method, it was decided to thoroughly investigate the relative value of each of the three methods with the idea of determining whether or not there was variation in the potency of serums obtained by the different methods.

A review of available literature developed the fact that little or nothing had been presented on the subject under consideration. Absence of reliable data made it seem advisable to conduct potency tests on sera obtained by the different methods above enumerated.

The first of the series of tests were conducted on sera from hogs which had been tail bled once followed by final or carotid bleeding seven days later. Ten serial lots of serum produced in the manner above described were tested in this manner, so that in reality ten tests were conducted. In each case the blood obtained from final bleeding was checked against that obtained from tail bleedings by injecting an equal number of susceptible pigs and comparing the protection afforded. The tests were conducted as nearly as possible to correspond with the regulation potency test prescribed by the Bureau of Animal Industry for the testing of anti-hog cholera serum. Under this regulation seven susceptible pigs are each given 2 cc of virulent hog cholera virus. Five receive 20 cc of anti-hog cholera serum each while the other two are left as controls to test the virulency of the virus injected into all seven. In order that the sera being tested could be properly compared ten pigs were inoculated with 2 cc each of virulent hog cholera blood. Four were given 20 cc anti-hog cholera serum drawn from the tail, as above described, while four were given 20 cc of anti-hog cholera serum obtained from the carotid bleeding, whereas two were left as controls. This scale applied to each of the tests conducted. In no case did the tests indicate a difference in the potency of the serum obtained by either method since the pigs were fully protected in all cases.

In view of the results above described it was deemed advisable to carry the investigation further. Two additional tests were, therefore, conducted, each test containing ten pigs and are described in detail under Charts Nos. 1 and 2.

CHART No. 1—TEMPERATURES AND VISIBLE SYMPTOMS
 Time Started April 8, 1919.

DESCRIPTION					DOSE	Day of Month Day of Test												
Tag No.	Weight	Color	Sex	Added Marks	DOSE	Day Inoculated		9	10	11	12	13	14	15	16	17	Day of Month Day of Test	
						Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature
Blood from first tail bleed.....	3552	82	R.B.	F.	R.	2	20	A.M.		2°	3°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	0°	0°	0°	0°	0°	0°	0°	0°	0°	Symptoms
Blood from first tail bleed.....	3565	96	S.B.	M.	R.	2	30	A.M.		3°	4°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	0°	0°	0°	0°	0°	0°	0°	0°	0°	Symptoms
Blood from second tail bleed.....	3544	112	S.B.	M.	L.	2	20	A.M.		2°	3°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	2°	2°	2°	2°	2°	2°	3°	3°	3°	Symptoms
Blood from second tail bleed.....	3550	100	B.W.	M.	F.L.	2	30	A.M.		3°	4°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	1°	1°	1°	1°	1°	1°	1°	1°	1°	Symptoms
Blood from third tail bleed.....	3546	94	B.W.	M.	F.R.	2	20	A.M.		3°	4°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	1°	1°	1°	1°	1°	1°	1°	1°	1°	Symptoms
Blood from third tail bleed.....	3551	92	B.W.	M.	T.R.	2	30	A.M.		3°	4°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	1°	1°	1°	1°	1°	1°	1°	1°	1°	Symptoms
Blood from final bleed.....	3537	98	B.W.	M.	R.	2	30	A.M.		3°	4°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	0°	0°	0°	0°	0°	0°	0°	0°	0°	Symptoms
Blood from final bleed.....	3541	93	B.W.	F.	L.	2	20	A.M.		2°	3°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	0°	0°	0°	0°	0°	0°	0°	0°	0°	Symptoms
Control.....	3539	93	S.B.	F.	R.	2	...	A.M.		2°	3°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	1°	1°	1°	1°	1°	1°	1°	1°	1°	Symptoms
Control.....	3564	100	W.	M.	L.	2	...	A.M.		3°	4°	4°	4°	4°	4°	5°	5°	Symptoms
								P.M.	0°	0°	0°	0°	0°	0°	0°	0°	0°	Symptoms

X—On feed—healthy.
+ Slow, but not sick.
S—Sick.
K—Killed.

X—On feed—healthy.

+—Slow, but not sick.

S—Sick.

K—Killed.

CHART No. 1—Continued.

[illegible]

X—On feed—healthy.

—Slow, but not sick

S—Sick.

K—Killed.

AUTOPSY FINDINGS—Chart No. 1										
Tag No.	Date of Autopsy	Skin	Glands	Bones	Lungs	Spleen	Stomach	Intestines	Kidneys	Bladder
3539	4/15		v		v	v		v	v	v
3564	4/15		v		v	v		v	v	v

v—Satisfactory lesions.

The animals listed on Chart No. 1 were all injected with 2 cc of virulent hog cholera virus. All serum and virus was injected intramuscularly. Pig No. 3552 received in addition to virus, 20 cc of blood obtained from the first tail bleeding of animals which had been hyperimmunized ten days previously. Pig No. 3565 received 30 cc of the same blood. Pig No. 3544 received 20 cc of blood obtained from the second tail bleeding from the same hogs that were used in the first tail bleeding. Pig No. 3550 received 20 cc of the same blood. Pig No. 3546 received 30 cc of blood obtained from the third tail bleeding from the same hogs. This bleeding was conducted one week after the second tail bleeding. Pig No. 3551 received 30 cc of the same serum. Pig No. 3537 received 30 cc of blood which was obtained when the animals were bled to death from the carotid artery one week after the third tail bleeding and thirty-two days after hyperimmunization. Pig No. 3541 received 20 cc of the same blood. Pigs Nos. 3539 and 3564 received no serum and served to act as controls on the virulency of the virus used. The control pigs sickened promptly. They were marked "sick" (S) on the sixth day and were killed on the seventh day. Autopsy showed lesions of acute hog cholera and the absence of other disease. Pig No. 3544 was marked "slow" (X) on the seventh day of test because of an intestinal disturbance; the temperature on that day was 3.8. On the eighth day this pig had returned to normal and remained so throughout the test. Other than this the animals all remained perfectly healthy throughout the test showing no physical symptoms of any disease and were not off feed at any time. There were some slight fluctuations in temperatures, but it will be noted that these were rather uniform and not of any more significance than the thermic fluctuations which frequently appear in any test.

CHART No. 2—TEMPERATURES AND VISIBLE SYMPTOMS

Time Started April 8, 1919.

	Tag No.	Weight	Color	Sex	Added Marks	DOSE	Day Inoculated		9	10	11	12	13	14	15	16	17	Day of Month	
							Symptoms	Temperature	1	2	3	4	5	6	7	8	9	Day of Test	
									Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms		
						Viru—D-22							Sunday						
						Serum—9464													
Blood from first tail bleed.....	3523	100	S.	M.	R.	2 20	A.M.	2 ⁰	2 ²	2 ²	3 ⁰	2 ⁶	1 ⁸	3 ²	2 ⁶	3 ⁸	3 ⁸	×	
							P.M.	2 ⁰	×	×	×	×	×	×	×	×	×	×	
Blood from first tail bleed.....	3531	94	S.	F.	L.	2 20	A.M.	3 ²	3 ⁰	3 ⁴	2 ⁸	3 ²	3 ⁶	4 ²	3 ²	3 ²	4 ⁶	×	
							P.M.	3 ²	×	×	×	×	×	×	×	×	×	×	
Blood from second tail bleed.....	3522	99	B.S.	F.	R.	2 20	A.M.	1 ⁶	2 ⁶	5 ⁸	2 ⁶	1 ⁶	3 ⁰	2 ⁰	1 ⁴	1 ⁴	1 ⁸	×	
							P.M.	1 ⁶	×	×	×	×	×	×	×	×	×	×	
Blood from second tail bleed.....	3533	99	S.B.	F.	L.	2 20	A.M.	1 ⁸	1 ⁸	2 ⁸	3 ⁰	2 ²	1 ²	3 ⁰	3 ⁰	3 ⁸	3 ⁰	×	
							P.M.	1 ⁸	×	×	×	×	×	×	×	×	×	×	
Blood from third tail bleed.....	3520	95	B.W.	M.	R.	2 20	A.M.	3 ²	2 ⁴	2 ⁶	2 ⁸	1 ⁸	4 ⁸	1 ⁶	1 ²	1 ²	3 ⁶	×	
							P.M.	3 ²	×	×	×	×	×	×	×	×	×	×	
Blood from third tail bleed.....	3529	94	S.B.	F.	R.	2 20	A.M.	1 ⁶	3 ²	5 ⁸	5 ⁰	4 ⁸	4 ⁴	3 ⁸	4 ⁶	5 ²	5 ²	×	
							P.M.	1 ⁶	×	×	×	×	×	×	×	×	×	×	
Blood from final bleed.....	3526	96	B.W.	M.	F.R.	2 20	A.M.	1 ⁰	3 ²	3 ²	3 ⁰	2 ⁴	3 ⁴	3 ⁴	3 ⁶	3 ²	3 ²	×	
							P.M.	1 ⁰	×	×	×	×	×	×	×	×	×	×	
Blood from final bleed.....	3530	100	B.W.	F.	F.L.	2 20	A.M.	2 ²	2 ²	2 ⁰	1 ⁴	2 ⁶	1 ⁸	2 ⁰	2 ⁶	2 ⁴	4 ²	×	
							P.M.	2 ²	×	×	×	×	×	×	×	×	×	×	
Control.....	3521	98	B.W.	F.	L.	2 ...	A.M.	1 ⁴	2 ⁰	3 ⁸	5 ⁶	6 ⁴	5 ²	4 ²	S	—	—	—	
							P.M.	1 ⁴	×	×	×	×	4 ⁸	S	5 ⁰	—	—	—	
Control.....	3536	94	B.W.	F.	T.R.	2 ...	A.M.	2 ⁸	2 ⁸	2 ⁰	4 ⁴	5 ²	4 ⁸	S	—	—	—	—	
							P.M.	2 ⁸	×	×	×	×	—	—	—	—	—	—	

X—On feed—healthy.

+—Slow, but not sick.

S—Sick.

K—Killed.

CHART No. 2—Continued.

	DESCRIPTION				DOSE		Day of Month																								
	Tag No.	Weight	Color	Sex	Added Marks	Virus—D-22	Serum—9474	Time		18		19		20		21		22		23		24		25		27		28		29	
								Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms	Temperature	Symptoms
Blood from first tail bleed.....	3523	100	S.	M.	R.	2	20	A.M.	3 ⁶	2 ⁰	×	×	3 ²	×	2 ⁸	×	3 ⁰	×	4 ⁶	×	4 ⁴	×	3 ²	×	3 ²	×	3 ²	×	1 ⁶	×	
Blood from first tail bleed.....	3531	94	S.	F.	L.	2	20	A.M.	4 ⁰	3 ⁸	×	×	3 ⁰	×	1 ⁶	×	3 ²	×	1 ²	×	1 ²	×	1 ⁶	×	3 ²	×	2 ⁰	×	1 ⁰	×	
Blood from second tail bleed.....	3522	99	B.S.	F.	R.	2	20	A.M.	2 ⁸	2 ⁶	×	×	1 ⁴	×	1 ⁶	×	1 ²	×	0 ⁴	×	0 ⁰	×	1 ⁴	×	3 ²	×	0 ⁰	×	1 ⁸	×	
Blood from second tail bleed.....	3533	99	S.B.	F.	L.	2	20	A.M.	3 ⁶	3 ⁶	×	×	3 ⁸	×	1 ²	×	2 ²	×	1 ⁰	×	1 ²	×	1 ²	×	3 ²	×	1 ⁸	×	1 ³	×	
Blood from third tail bleed.....	3520	95	B.W.	M.	R.	2	20	A.M.	2 ⁴	2 ⁸	×	×	3 ⁰	×	0 ⁰	×	2 ⁰	×	2 ²	×	3 ²	×	2 ⁸	×	3 ²	×	2 ⁰	×	1 ⁰	×	
Blood from third tail bleed.....	3529	94	S.B.	F.	R.	2	20	A.M.	6 ⁰	4 ⁶	×	×	2 ²	×	2 ²	×	1 ⁸	×	1 ²	×	1 ⁸	×	0 ⁶	×	3 ²	×	2 ²	×	2 ⁰	×	
Blood from final bleed.....	3526	96	B.W.	M.	F.R.	2	20	A.M.	5 ²	4 ⁸	×	×	2 ⁶	×	1 ⁶	×	1 ⁴	×	0 ⁶	×	1 ⁰	×	1 ⁶	×	3 ⁰	×	3 ⁰	×	2 ³	×	
Blood from final bleed.....	3530	100	B.W.	F.	F.L.	2	20	A.M.	4 ⁶	4 ⁰	×	×	1 ²	×	1 ⁰	×	2 ⁶	×	3 ⁶	×	0 ⁶	×	2 ⁰	×	2 ⁸	×	2 ⁸	×	2 ⁶	×	
Control.....	3521	98	B.W.	F.	L.	2	...	A.M.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Control.....	3536	94	B.W.	F.	T.R.	2	...	A.M.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

X—On feed—healthy.
+—Slow, but not sick.
S—Sick.
K—Killed.

X—On feed—healthy.

+—Slow, but not sick.

S—Sick.

K—Killed.

AUTOPSY FINDINGS—Chart No. 2										
Tag No.	Date of Autopsy	Skin	Glands	Bones	Lungs	Spleen	Stomach	Intestines	Kidneys	Bladder
3521	4/15		v		v	v		v	v	v
3536	4/15		v		v	v		v	v	v

v—Satisfactory lesions.

Chart No. 2.

This test consisted of ten pigs. As in the test described under Chart No. 1, all ten pigs received 2 cc of virus intramuscularly. The main difference between this test and that described on Chart No. 1 is that all pigs listed in Chart No. 2 which received serum were given 20 cc rather than one receiving 20 cc and the other receiving 30 cc. Pigs 3523 and 3521 received 20 cc of serum obtained from the first tail bleeding. Pigs 3522 and 3533 received 20 cc serum obtained from the second tail bleeding. Pigs 3520 and 3529 received serum from the third bleeding. Pigs 3526 and 3530 received serum from the final or carotid bleeding, while Nos. 3521 and 3536 received no serum and served to act as controls on the virulency of the virus.

It will be seen that the control pigs sickened on the sixth day and were killed on the seventh day. Autopsy showed only lesions of acute hog cholera. The animals which received serum showed no symptoms of sickness at any time during the test. They were marked "on feed" and were at all times during the test period of 21 days.

CONCLUSIONS.

The experiments presented in this article indicate that anti-hog cholera serum obtained by bleeding swine to death known as "carotid bleeding" is not more potent than serum obtained by carotid bleeding preceded by one, two or three tail bleedings.

The circulating blood of hogs properly hyperimmunized against hog cholera retains its potency without the injection of additional antigen for at least 38 days regardless of whether the animal is bled one, two, three or four times.

There is apparently no difference in the relative potency of the anti-hog cholera serum obtained from any of the four bleedings above described.

SPECIAL REPORT ON THE HISTO-PATHOLOGY OF GLANDERS.

By CAPTAIN HADLEIGH MARSH, V. C.

The following illustrations should have accompanied the paper by Captain Marsh which appeared in the October JOURNAL, page 40, but were not sent in until after the issue was mailed. At the request of the author, however, we are reproducing them in the November number.

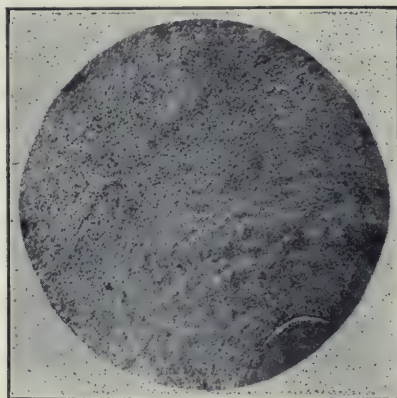


FIGURE 1.

Section through chronic glanders nodule in horse, Specimen No. 11. Low power.

The necrotic center is shown at one edge of the figure, with the different zones shown at one side of the center of the nodule. The connective tissue matrix is shown with the numerous eosinophiles appearing as black spots in the outer zone of the lesion.

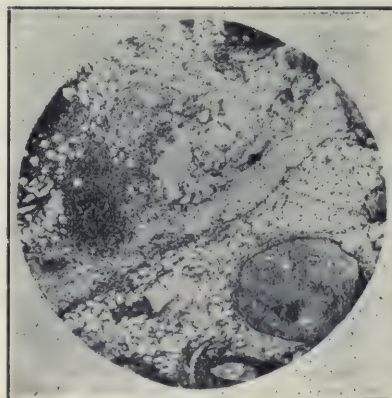


FIGURE 2.

Sections through omentum of Guinea Pig 265, showing two acute glanders nodules, and relation to lymph channel shown running across the section.

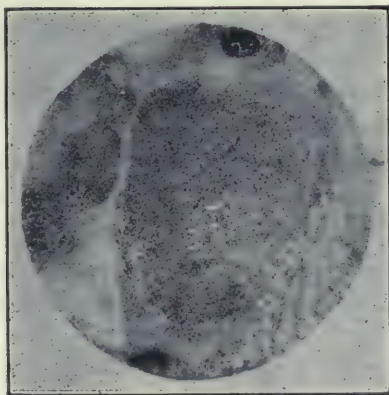


FIGURE 3.

Low power view of acute glanders nodule in omentum of Guinea Pig 265. This is one of the larger nodules and shows an accumulation of eosinophiles at one side of the lesion.

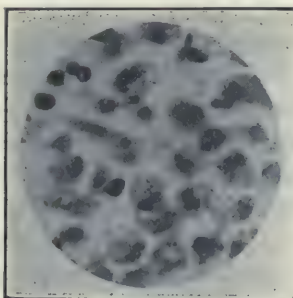


FIGURE 4.

High power view of small portion of nodule in omentum of Guinea Pig 265, showing eosinophiles.

Dr. B. M. Lyon, who for the past three years has been employed in the Lederle Antitoxin Laboratories of New York, has recently been made Assistant Director of the Veterinary Department under Dr. A. Eichhorn. Dr. Lyon for two years previous to his connection with the Lederle Laboratories was employed by the H. K. Mulford Biological Company.

Dr. Roy V. Rafnel, who for the past several years has been connected with the work of Tick Eradication in Louisiana, has resigned his position to accept that of Special Representative of the southern division for The Glidden Co., of Cleveland, Ohio, manufacturers of cattle dip and Insecticide. Dr. Rafnel's new headquarters will be New Orleans.

CLINICAL AND CASE REPORTS.

ENURESIS.

By OSCAR SCHRECK,
New Haven, Conn.

The patient, a Boston Bull, age two years, had suffered from enuresis since puppyhood, the sequel of distemper. On examination there was also evidence of slight choreiform symptoms present.

The animal received both local and general treatment by several veterinarians, but without relief, till the owner became discouraged and wished to have the animal destroyed. The urine would be passed every little while, but in small quantities. I obtained permission from the owner to try Naphthol in the following manner and results. A number 1 capsule was filled with naphthol (did not weigh the amount), and one such capsule given b. i. d. After 4 days the enuresis rapidly lessened. At the end of seven days the treatment was stopped, and there was a gradual return of the symptoms. Recourse was again had to the above drug, with the same results of gradual remission of the frequent micturition. The treatment was carried on for 14 days, and then again withdrawn, with no return of the enuresis. This report is made four weeks after stopping the treatment. The employment of naphthol did not, however, appear to exert any influence upon the choreiform symptoms. The above results go to show that further study into the action of this drug is needed.

AN INTERESTING CASE.

By W. M. BURSON,
Athens, Ga.

A six months old grade Percheron colt, an orphan since it was one week old, was being raised on cow's milk, pasturage and grain. It became rough coated, lost appetite to a considerable extent, would not graze but would eat green stuffs given to it fairly well. Spent most of its time lying down. The writer was called and upon examination found that the colt's feet were

grown out too long and were badly affected with thrush. Appropriate treatment consisting of shortening the feet to proper length, cleansing and disinfecting the decayed areas was applied. The colt improved and for several days was quite active and the appetite improved and the animal grazed quite well for about one week. This was followed by another period of decline. The writer was again called and upon making an examination of the feet found them nearly healed. The thrush was evidently not the cause of all of the trouble. A careful examination disclosed partially healed fractures of the 17th and 18th ribs on the left side at about their middle. A diagnosis of peritonitis was made. At this time the colt refused to stand except for a few minutes at a time and there was evident soreness of the abdominal wall, especially on the left side. Local and systemic treatment was applied, the object being to stimulate the appetite, build up the system and reduce the inflammation. At the end of one week the colt died.

Postmortem examination showed the fractured ribs nearly healed. The inflammatory zone surrounding the fractures was small and well circumscribed. The abdominal wall was badly inflamed throughout its entire depth over an area more than one foot in diameter. It proved to be heavily infested with strongyli (Palisade worm), twenty-five being taken from a section of abdominal wall three inches square.

A STUDY OF THE FECAL EXAMINATIONS OF 1000 IMPORTED DOGS.

MEYER WIGDOR, M. A.,

Junior Zoologist, Bureau of Animal Industry, Washington, D. C.

For a number of years, since January, 1911, the feces of imported dogs have been examined in this laboratory by various workers here, including Doctors Ransom, Hall, Graybill, and May, and by Messrs. Foster, Garlough, and Schwartz, and the writer. The findings have been summarized from time to time by Doctor Ransom in the Annual Reports of this Bureau, and were published in detail at an early date by Foster (1912).¹

The fecal examinations were in compliance with Order No. 176 of the Bureau of Animal Industry, November 25, 1910,

¹ Foster (1912). Analysis of the results of 87 fecal examinations of sheep dogs for evidences of parasitism. *Science*, n. s. (901), v. 35, pp. 553-554.

which requires that all collie or sheep dogs imported into this country be held in quarantine pending the results of a fecal examination. The object of the fecal examination is to prevent the importation into this country of such injurious parasites as the gid tapeworm and the hydatid tapeworm, parasites injurious to live stock and to man. These dogs are held in quarantine until fecal examinations have been made and the animals found free from dangerous parasites. Dogs are notorious carriers of parasites and it is obviously undesirable to complicate the present problems of eradication and the application of prophylactic measures by importing fresh supplies. If a preliminary fecal examination shows the presence of *Tænia* eggs or proglottids, suitable anthelmintics are administered to remove the parasite before the animal is released from quarantine.

Data are now available on the fecal examinations of 1000 imported dogs which have been examined from January, 1911, through July, 1919. The termination of the World's War gave a great impetus to this importation of foreign dogs into this country, as the men who had seen service abroad in our army brought back considerable numbers, especially of the German sheep dog.

Among the breeds of dogs imported, the various breeds of sheep dogs were most numerous. They included the Belgian, English, German, French, Russian, and Dutch sheep dogs. Collies were next in number and included the Scotch, Shetland, short-haired, and other breeds. German and Belgian police dogs were quite common and there were a limited number of wolf hounds.

In connection with these fecal examinations, the nature of the infestations with intestinal parasites is of interest. Of the 1000 dogs examined, 540, or 54 per cent, were negative on fecal examination. Of the 460, or 46 per cent, that were infested, 258, or 26.8 per cent, were infested with ascarids, of which there were approximately three times as many *Toxascaris limbata* as there were *Belascaris marginata*; 86, or 8.6 per cent, were infested with hookworm (probably *Ancylostoma canium* as a rule, but in some cases the species was probably *Uncinaria criniformis*); 15, or 1.5 per cent, were infested with whipworm (*Trichuris depressiuscula*); 36, or 3.6 per cent, were infested with *Dipylidium*; 152, or 15.2 per cent, were infested with *Tænia*; 1 or 0.1

per cent, were infested with flukes; 1, or 0.1 per cent, were infested with a larval nematode, probably *Hæmostrongylus vasorum*; and 1, or 0.1 per cent, were infested with a *Diphyllobothrium* sp. The dog infested with *Diphyllobothrium* was a Russian sheep dog and the worm on examination proved to be a different species than *Diphyllobothrium latum*.

Of the 152 dogs infested with tænioid cestodes, there were
68 infestations with *Tænia pisiformis*,
18 infestations with *Tænia hydatigena*,
15 infestations with *Multiceps serialis*,
1 infestation with *Multiceps multiceps*.

In 52 infestations with *Tænia*, the species was not determined.

Two dogs were infested with two species of worms, which accounts for the apparent total of 154 in this list.

The high percentage of dogs with negative fecal findings is perhaps associated with the fact that dogs valuable enough to import are usually well cared for and kept in cleanly surroundings. It is also true that a negative fecal examination is not entirely conclusive evidence of freedom from parasites. The absence of parasitic ova in the feces does not preclude the possibility of parasitic infestation, as many factors may account for the absence of the ova in the feces in spite of infestation. The low percentage of *Dipylidium*, hookworm, and the especially low whipworm infestation is interesting in view of the fact that 30 to 50 per cent of the dogs in most regions of the United States from which we have available data, are infested with these worms. While a majority of the dogs imported into this country are free from intestinal parasites, so far as fecal examinations show, the occasional occurrence of such parasites as *Multiceps multiceps*, is evidence of the need for the quarantine and examination of imported dogs.

A CASE OF SPINDLE-CELLED SARCOMA OF THE SKIN AND SUBCUTANEOUS TISSUES.

By B. F. KAUPP, Pathologist, N. C. Experiment Station, W. Raleigh, N. C.

Sarcomata is a disease of the connective tissue and consists of embryonic type cells. It is a malignant tumor and may affect the tissues of any of the organs of the body springing from the

connective tissue of the part. It may spread by contiguity of tissue or by metastases. The following is an interesting case.

History.—A Buff Orpington hen six years old and a member of the station flock. Has suffered from an opacity of the crystalline lense due to a cataract of the right eye. The bird is rather thin in flesh and on account of her age and having passed her stage of usefulness as a breeder was used as a bird in student fattening work. She did not make satisfactory gain in weight and on account of her heavy feathering the subcutaneous tumors not pushing out to any great extent, was not noted to be affected with tumors.

On April 2nd, 1919, she was selected for use in dry picking and boning work but after being killed and her condition being noted was sent to the pathological laboratory for further study.



FIGURE 1.

Photograph of dressed carcass of a hen. Alveolar Sarcoma. 1. Tumors of shoulder region. 2. Tumors of the forearm. 3. Tumors of the dorsal region. 4. Tumors of the sides.

Autopsy.—As shown in Fig. 1, the back and to a less extent the sides of the bird were studded with subcutaneous tumors; 2 tumors on the pleural or inner wall of the thorax of the left side measured 4 mm. each in diameter. All the balance of the tumors were on the superficial portion of the body of the hen. One tumor near the shoulder of each wing measured 20 x 13 x 10 mm.; 2 in the region of the right forearm measured 7 mm. in

diameter; one in the region of the left forearm measured 12x12x6 mm. in a mass coalescing all along the dorsal portion from the level of the shoulder region to and involving the caudal region. This mass varied in thickness, being 12 mm. in the thickest portion. In the widest portion the tumorous mass was 6 cm. broad. The entire length of the mass was 18 cm.

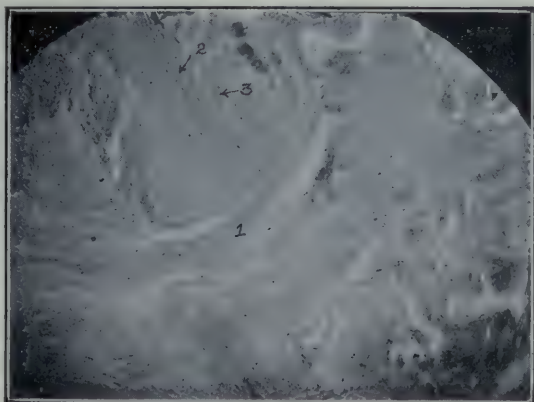


FIGURE 2.

Photomicrograph of a Spindle Celled Alveolar Sarcoma. 1. Adult connective tissue forming alveolar wall. 2. Spindle cells cut transversely. 3. Spindle cells cut longitudinally.

There are no lesions of the internal organs. The tumors are closely associated with the skin with the exception of the two tumors in the left pleural region. On the sides of the carcass there are about 40 tumors varying in size up to 6 mm. in diameter. These tumors of the sides and upper tibial region were smaller and consequently considered younger tumors than those of the dorsal region. The tumors of the dorsal region are considered the primary tumors; those of the sides spreading by metastases while the primary tumor has also apparently spread by contiguity of tissue. There were no tumors involving the lower tibial region, the shanks or the feet, nor were there any tumors involving the head and neck. A few tumors varying from 3 to 4 mm. in diameter involved the lower chest region.

The tumors cut rather hard under the knife, indicating considerable of connective tissue.

Anatomical Diagnosis.—Malignant tumor.

Microscopical Study.—Specimens from three of the tumors; one from the shoulder, one from the middle of the back, and one

from the caudal region were saved for microscopic study. The specimens were hardened in 10 per cent. solution of formalin, dehydrated in alcohol; then alcohol and ether equal parts and embedded in parlodion and sectioned to 15 mm. in thickness. These sections were then stained in hematoxylin and eosin and clarified in oil of cedar, and mounted in natural balsam.

The section shows adult type connective tissue extending in various directions and in bundles making alveoli. These alveoli are filled with embryonic type spindle cells. In figure 2 will be seen at 1, the spindle cells, at 2 the spindle cells cut diagonally, at 3, the spindle cells cut transversely, and the adult connective tissue forming walls or alveoli in which the nests of cells are located. Looking at the nuclei from the side view or longitudinal view of the cell they are noted to be about twice as long as broad with rounded ends and rather large in size. In the cells cut transversely at the nuclear level the nucleus appears round. The tumors are surrounded with adipose tissue. The skin and subcutaneous tissues of the fowl is one of the normal storehouses of fat in the fowl. These cells are more of the embryonic rather than of the adult type of cells. The cells are tightly or closely packed in the alveoli.

Microscopic Diagnosis.—Spindle celled alveolar sarcoma.

These tumors have sprung from the subcutaneous connective tissue.

INVESTIGATION OF THE DEATH OF CHICKS. COCCIDIAN HEPATITIS.

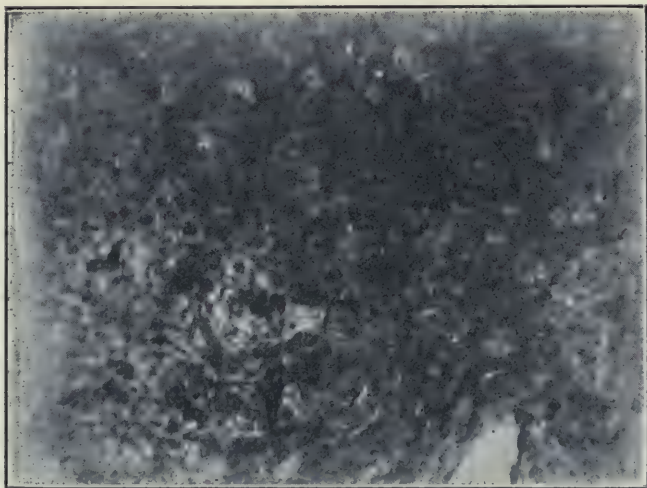
By B. F. KAUPP, Pathologist, N. C. Experiment Station, W. Raleigh, N. C.

HISTORY.

A flock of baby chicks about 3 weeks old are dying of so called sleeping sickness. The chicks mope about, do not eat, sit "hunched up" and sleep till they die. They are drowsy and stupid. They always die.

AUTOPSY.

In some of the chicks at autopsy there are no lesions. One chick showed necrotic-appearing areas of the liver. These areas were about one-fourth inch in diameter. Specimens were saved for microscopic study.



Photomicrograph of a section of the liver showing the coccidia indicated by the arrows. Note the double limiting membranes.

MICROSCOPIC STUDY.

In a study of sections, hardened in formaldehyde and imbedded in paraloid and stained with hematoxylin-eosin, zones around the necrotic areas showed active congestion, in a zone closer to the central area cells were in various stages of cloudy swelling, some nuclei showing pycnosis, and in still closer zones the nuclei were scarcely visible and in fact were in a state of lysis. Finally the central mass was in a state of dead and disintegrating cells. The central areas were packed with oval double limiting membrane bodies and these have pushed their way more or less into and between columns of hepatic cells in the outer affected area. These cells are coccidia and the condition is that of coccidian hepatitis.

MICROSCOPIC DIAGNOSIS.

Coccidian hepatitis.

Dr. Claude Sevy has resigned his position with the Bureau of Animal Industry, where he was engaged in the work of Tick Eradication in Louisiana with headquarters at Morgan City, and has gone to Richfield, Utah, to engage in the sheep raising industry.

Dr. W. B. Van Cleave has entered practice at Chrisman, Ill.

ABSTRACTS.

PRESENCE OF AN ANTERIOR JUGULAR VEIN IN THE HORSE ACCOMPANIED BY JUGULO-CAROTID ANEURYSMAL ANASTOMOSIS.

C. BRESSOU,
Rec. Med. Vet. Vol. XCV., No. 8. 30th April 1919. Bull. Soc. Centr. Med. Vet.
3rd April 1919. Pp. 147-154. 2 Figures.

In a horse in which the right and left jugular veins were present and normal, a large vein was discovered ventral to the trachea, covered and completely surrounded by the sterno-hyoid muscles. The accessory vessel took origin by two roots; one sprang from the external maxillary vein, and the other was a continuation of the sublingual vein. The vessel thus formed was connected by transverse anastomosis with the left jugular vein in the upper and lower fourths of the neck, and at the entrance to the chest it finally joined the left jugular.

The thyroid artery on the left side of the neck was represented by several vessels, two of which approached a slight dilatation of the supernumerary vein, and divided into very fine, flexuous arterioles. These opened into the vein and thus established an anastomotic relationship between the arterial and venous systems.

The author is of opinion that the accessory vein must be regarded as an anterior jugular, such as is present in the human subject.—*Vet. Rev.*

OSTEOPOROSIS OF THE HORSE IN THE BELGIAN CONGO.

R. VAN SACEGHEM,
Bull. Soc. Path. Exot. Vol. XII., No. 5. May 1919. Pp. 238-243.

The author contends that rickets, osteomalacia, and osteoporosis arise from identical causes. He suggests, therefore, that there should be a common generic name to indicate all three conditions, and thinks that the term "osseous cachexia" is suitable. At the same time, there is no reason why the different manifestations of the affection should not be indicated. Thus, osseous cachexia of the young is "rickets;" osseous cachexia of the adult

is generally known as "osteomalacia;" while osseous cachexia of equines bears the distinctive name of "osteoporosis."

Osteoporosis of equines is very common in the Belgian Congo, and van Saceghem has sought for a cause in the amount of calcium content in soil and water. In those districts where the natural waters hold little or no calcium in solution (Lamba, Kitobola, Nyangwe) osteoporosis occurs; while it never appears in those regions where the natural waters contain calcium (Zambi).

The author, therefore, concludes that osteoporosis in the Congo is due to lack of calcium.—*Vet. Rev.*

OBSERVATIONS WITH REGARD TO THE ETIOLOGY OF JOINT-ILL IN FOALS.

SIR JNO. M'FADYEAN AND J. T. EDWARDS,
Journ. Comp. Path. and Therap. Vol. XXXII., No. 1. March 1919. Pp. 42-71.

The bacteriological findings in thirty-seven cases of joint-ill are given. The routine method employed was the withdrawal of part of the liquid from the joint cavity by means of a sterile pipette, and the use of the fluid so obtained for making films for microscopic examination and to serve as seed material for cultures. The joint was subsequently opened with boiled instruments. Four groups of organisms were discovered, namely, streptococci, *Bacillus nephritidis equi*, *Bacillus abortivo-equinus*, and coliform bacilli.

In twenty of the thirty-seven cases streptococci were the cause of the lesions. The morphology, staining reactions, capsule formation, cultural characters, sugar fermentation tests, agglutination tests, hæmolytic properties, and pathogenicity, it was impossible to find any important differences among the joint-ill strains of streptococci, or between them and other streptococci isolated from cases of pneumonia, pleurisy or strangles in horses. So far as the authors are aware, *Bacillus nephritidis equi* has not previously been recognized as one of the causes of pyæmia and joint-ill in foals, or indeed described as occurring elsewhere than in South Africa. This organism was apparently the sole cause of disease in four cases, and it was present in three others in association with other diplococci or coliform bacilli.

Bacillus abortivo-equinus was the cause of disease in two of the thirty-seven cases. *Bacillus coli communis*, or organisms closely resembling it, were cultivated from joints usually in association with other bacteria, which were probably responsible for the lesions. But in four cases it seems probable that the bacilli were actually the cause of the disease. In morphology and cultural characters these strains resemble the colon bacillus, but cross agglutination tests indicated that they differ from a typical strain of *B. coli* supplied by the Lister Institute.—*Vet. Rev.*

OSSEOUS MELANOSIS.

Petit described this condition to the Central Society of Veterinary Medicine in 1914. If, in post-mortem examinations, the skeletal system is well examined, it is evident that osseous melanosis, microscopically recognizable, should not be considered as a rarity. The blood transports into the medulla, as into all other parts, not only melanin, but also sarcomatous cells which have become separated from their original seat, and which proliferate and develop in the ordinary fashion, but have less destructive tendencies towards the bony tissues than those shown by ordinary metastatic sarcomatous growths. Osseous melanosis therefore does not consist exclusively in a pigmentary infiltration of the medulla, realized up to a certain point by the detention and accumulation of fine melanic granules, as might be thought from the aspect of certain parts of the lesions. The process is frequently an active one in the sense that it is united with the transportation by the blood into the spongy cavities of the bone of the neoplastic cells themselves.

Vertebral Melanosis. In the horse, it is not rare to find the presence of voluminous sub-dorsal melanic tumours, or sub-lumbar ones, which may be recognized during life by rectal exploration. These tumours frequently spread into the rachidian canal, which they fill to a certain extent, englobing the nervous roots and more or less repulsing the duramater, which is not easily penetrated. This does, however, occur; and then the spinal cord itself is directly and dangerously englobed by the tumour. Numerous cases of paraplegia, occasioned by a lesion of this nature, have been observed in the horse.

At the same time as this propagation of the tumour into the rachidian canal, the vertebræ adjacent to the melanoma and englobed by it also become pigmented. This is not so much from contiguity of the tissues as from the deposition of either pigment or sarcomatous cells in the osseous tissue by means of the nutritive vessels.

In *costal melanosis* distinct types of invasion may be observed. Sometimes the pleura is covered with disseminated sarcomatous nodules, some small and others considerable, principally distributed opposite the intercostal spaces. These tumours may be black or grey, and are frequently conglomerated. The ribs are usually all invaded; and at certain points the pigmentary infiltration appears as clearly through the pleura as when seen in transverse section.—(*Revista de Higiene y Sanidad Veterinaria*).

W. R. C. in *Vet. Rec.*

NAMES OF ONTARIO GRADUATES WANTED FOR ROLL OF HONOR.

Principal McGillvray informs THE JOURNAL that the Ontario Veterinary College is arranging for a Roll of Honor for its graduates who served during the late war in the Imperial, Canadian and American Veterinary Corps. A fairly complete list of those who served with the Imperial and Canadian forces has been secured, but there were, doubtless, a large number of the college graduates who were members of the American Veterinary Corps, and the Ontario Veterinary College would be pleased to include their names in the College Roll of Honor if it were possible to obtain them. Consequently those desirous of having their names included in the Roll of Honor should send the same direct to the college in Toronto.

Dr. McGillvray further informs THE JOURNAL that it is the intention of the college to have a memorial tablet specially designed to commemorate the services rendered by members of the faculty, graduates and undergraduates, the design for which will be The Flanders Cross, a reproduction of which will likely be seen in a later issue of THE JOURNAL.

Dr. D. C. Beaver, formerly of Detroit, Mich., has accepted a position with the department of Veterinary Medicine of the University of Minnesota.

ARMY VETERINARY SERVICE.

FROM THE OFFICE OF THE SURGEON-GENERAL OF
THE ARMY, WASHINGTON, D. C.

OFFICERS, VETERINARY CORPS, UNITED STATES ARMY.

	On Duty	
	September 11, 1919	October 11, 1919
Colonels	0	0
Lieutenant Colonels	5	5
Majors	47	43
Captains	90	77
First Lieutenants	187	167
Second Lieutenants	109	86
Totals	438	378

COMMENDATION FOR MAJOR McAUSLIN.

Headquarters 4th Division
Office of the A. C. of S., G-1.

1 July, 1919.

From: Lt. Col. Wm. F. Robinson, Jr., A. C. of S., G-1, 4th
Division.

To: Commanding General, Third Army (attention Chief
Veterinarian), through Commanding General, 4th
Division.

Subject: Major R. A. McAuslin, Division Veterinarian.

1. Upon the eve of the departure of the 4th Division to the United States, I take the opportunity of bringing to your attention the Division Veterinarian, Major Robert A. McAuslin, V. C.

2. He is an officer of exceptional ability, extremely interested in his work, highly efficient, and absolutely loyal to his superiors and the service he represents.

3. Since the last of April, when the Division Remount Officer was relieved, Major McAuslin has done this work in addition to his other duties. Through his untiring efforts and ability as an organizer, the remount service has been highly developed and satisfactorily handled in this Division.

(Signed) WM. F. ROBINSON.

1st Ind.

Headquarters, 4th Division, American E. F., 1 July 1919.—
To Commanding General, Third Army (attention Chief Veteri-
narian). Forwarded.

1. Commendation of Lt. Col. Wm. F. Robinson, Jr., Concurred in.

(Signed) MARK L. HERSEY,
Major General, U. S. A.

The following officers have resigned from the Veterinary Corps during the past month:

Captain Oliver A. Barber, 1st Lieut., V. C., R. A.

Captain Joseph N. Graves, 2nd Lieut., V. C., R. A.

1st Lieut. Owen Howells, 2nd Lieut., V. C., R. A.

The following orders of transfer and reassignment have been issued for veterinary officers.

1. Lieut. Col. Gerald E. Griffin, U. S. A., now on duty at Atlanta, Ga., is relieved from station at that place and directed to proceed to Washington, D. C. for station in addition to his present duties relieving Major John P. Turner, V. C. of his duties as veterinary inspector for the Northwestern District.

Major Turner was honorably discharged from the Veterinary Corps on Sept. 29th, 1919.

1. Major R. M. Buffington, U. S. A., recently reported from overseas has been assigned as Camp Veterinarian, Camp Taylor, Kentucky.

2. Major W. V. Lusk, U. S. A., from Walter Reed General Hospital, Tacoma Park, D. C., to U. S. Military Academy, West Point, N. Y. as Post Vet'n.

3. Major B. A. Seeley, U. S. A., from U. S. Army General Hospital No. 1, Williamsbridge, N. Y. to Auxiliary Remount Depot, Camp Meade, as the Vet'n.

4. Major G. H. Dean, U. S. A., from Auxiliary Remount Depot, Camp Meade, Maryland to Chicago, Illinois, for instruction in meat inspection.

1. Captain C. E. Cook, V. C., from Camp Taylor, Ky., to Front Royal Remount Depot, Front Royal, Va., as The Vet'n and Purchasing Zone Vet'n.

2. Captain O. J. Conzelmann, V. C. from Ft. Robinson, Nebr., to Kansas City, Missouri for duty on horse purchasing board.

3. Captain J. F. Crosby, V. C. from Camp Knox, Ky. to Ft. Snelling, Minn., as Post Vet'n.

4. Captain J. E. Behney, V. C. from A. R. D. No. 329, Camp Travis, Texas, to Kansas City, Missouri for duty on horse purchasing board.

5. Captain P. T. Pedersen, V. C. from Chicago, Illinois to Philippine Islands for duty in that Department.

6. Captain B. C. Bridges, V. C. who has recently arrived from overseas to Ft. Keogh, Remount Depot, Montana.

7. Captain E. C. Conant, V. C. from Chicago, Illinois to Ft. Keogh Remount Depot, Ft. Keogh, Montana.

8. Captain J. H. Drayer, V. C. from A. R. D., Camp Jackson, S. C., to Ft. Ethan Allen, Vt. as Post Vet'n.

9. Captain D. J. Holton, V. C. from A. R. D., Camp Lee, Va., to A. R. D., Camp Travis, Texas.

10. Captain C. S. Parker, V. C. from Camp Dix, N. J., to Camp Dodge, Iowa, for duty with the 4th Division.

11. Captain R. P. Kunnecke, V. C. from 1st Division, Camp Meade, Md., to Ft. Keogh, Remount Depot, Ft. Keogh, Montana.

12. Captain C. L. Miller, V. C. from 1st Division, Camp Meade, Md., to Camp Dodge, Iowa, for duty with the 4th Division.

13. Captain R. H. Glenn, V. C. from 1st Division, Camp Meade, Md., to Camp Gordon, Ga., for duty with the 5th Division.

14. Captain W. H. Dean, V. C. from Camp Pike to Chicago, Illinois for instruction in meat inspection.

15. Captain Gordon B. Huse from duty as Camp Vet'n, Camp Lee, Va., to 15th Inf. Brigade, Camp Meade, Md. for duty with the American Forces in Germany.

16. Captain F. R. Harsh, V. C. from duty as Camp Vet'n, Camp Shelby, Miss., to Camp Lee, Va., as the Camp Vet'n.

Dr. E. Pegram Flower, Louisiana Live Stock Sanitary Board, and Dr. R. V. Rafnel, B. A. I., Baton Rouge, La., attended the First Conference on Tuberculosis Eradication in Chicago, in the early part of October.

Dr. H. A. Burton has been transferred from the work of Tick Eradication in Louisiana to the same class of work in North Carolina.

Dr. Ray Kelly, formerly of Knob Noster, Mo., is now located at Arkadelphia, Ark.

ASSOCIATION NEWS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

FIFTY-SIXTH ANNUAL MEETING OF THE A. V. M. A.

THE JOURNAL is in receipt of the program for the fifty-sixth annual meeting of the American Veterinary Medical Association which will be held in New Orleans November 17 to 21; headquarters, Grunewald Hotel.

A careful study of the program will show that a greater number of subjects are to be discussed than perhaps ever before undertaken in the history of the Association. The topics are practical and pertain to those subjects which we are compelled to deal with at the present time.

The local committees have had much to contend with, but feel that they have fulfilled their obligations and assure those who will attend that they are more than welcome to the Crescent City. Many little details are still being looked after and if you do not arrive before Saturday, November 15, you will see three sides of the Grunewald Hotel decorated in red, white and blue; notably, red lettering on white back-ground, and the blue cross to distinguish the profession.

A program and entertainment has been provided for the ladies which should make them happy and contented. The Ladies Auxiliary can have the use of Room E on the Mezzanine floor for frequent meetings and it is sincerely hoped they will arrange for a committee to confer with the officers of the Association and local committeemen from time to time in order that all information in regard to entertainments may be uniformly understood.

In the main lobby of the hotel opposite the registration desk will be an A. V. M. A. information booth in charge of a competent Louisiana French lady who will be a fountain of knowledge concerning New Orleans. If you are lost and want to know where you are just ask her and she will make you think you are safe at home surrounded with hundreds of good friends and not a single thing to worry about.

OFFICERS AND COMMITTEES, 1918-1919.

V. A. Moore, President, Ithaca, N. Y.
A. Eichhorn, First Vice President, New York, N. Y.
H. B. Cox, Second Vice President, Philadelphia, Pa.
Geo. H. Hart, Third Vice President, Berkeley, Cal.
Thos. E. Smith, Fourth Vice President, Jersey City, N. J.
J. B. Hollingsworth, Fifth Vice President, Ottawa, Can.

EXECUTIVE BOARD.

Geo. Hilton, 1st District; T. E. Munce, 2nd District; S. E. Bennett, 3rd District; J. R. Mohler, 4th District; C. H. Stange, 5th District; R. A. Archibald, 6th District; A. T. Kinsley, Member at Large.

SUB-COMMITTEE ON JOURNAL.

J. R. Mohler, Geo. Hilton, R. A. Archibald.

COMMITTEE ON INTELLIGENCE AND EDUCATION.

Geo. W. Dunphy, Chairman; J. A. Kiernan, Cassius Way, Geo. H. Hart, H. D. Bergman.

COMMITTEE ON LEGISLATION.

W. Horace Hoskins, Chairman; J. P. Turner, S. J. Walkley, C. B. Palmer, F. A. Bolser.

COMMITTEE ON RESOLUTIONS.

C. A. Cary, Chairman; C. D. McGilvray, Chas. E. Cotton, H. Jensen, Otto Faust.

AUDIT COMMITTEE.

H. K. Ryder, Chairman; L. Enos Day, W. H. Robinson, C. G. Lamb, W. J. Martin.

COMMITTEE ON NECROLOGY.

J. W. Connaway, Chairman; R. W. Ellis, E. A. Cahill, J. B. Hollingsworth, G. F. Jungerman.

COMMITTEE ON HISTORY.

R. C. Moore, Chairman; A. L. Mason, U. G. Houck, C. H. Higgins, Geo. H. Berns.

COMMITTEE ON ANATOMICAL NOMENCLATURE.

H. S. Murphy, Chairman; S. Sisson, I. Ernest Newsom, F. W. Chamberlain, Mark Francis.

COMMITTEE ON ARMY SERVICE.

Lt.-Col. C. J. Marshall, Chairman; Jno. R. Mohler, L. H. Howard, Lt.-Col. R. J. Stanclift, Maj. W. H. Lytle.

BUDGET COMMITTEE.

(Ex-Officio Membership).

V. A. Moore, M. Jacob, N. S. Mayo, Jno. R. Mohler.

SALMON MEMORIAL COMMITTEE.

J. F. Winchester, Chairman; W. Horace Hoskins, Secretary-Treasurer; J. S. Anderson, S. Brenton, David F. Fox, J. G. Rutherford, Jno. R. Mohler.

LIAUTARD MEMORIAL COMMITTEE.

Robert W. Ellis, Chairman; W. H. Hoskins, W. H. Dalrymple, W. H. Lowe, S. Brenton.

SECTION ON GENERAL PRACTICE (MEDICINE AND SURGERY).

A. S. Cooley, Chairman; John Harper, Secretary.

SECTION ON SANITARY SCIENCE AND POLICE.

L. Enos Day, Chairman; H. Preston Hoskins, Secretary.

INTERNATIONAL COMMITTEE ON BOVINE TUBERCULOSIS.

Fred. Torrance, Chairman; Jacob Traum, C. E. Schroeder, J. G. Willis, Chas. E. Cotton, J. J. Ferguson, Honorary Member c/o Swift & Co.

LADIES AUXILIARY.

President, Mrs. W. H. Hoskins.

Recording Secretary, Mrs. Chas. E. Cotton.

Corresponding Secretary, Mrs. Ashe Lockhart.

Treasurer, Mrs. H. B. Cox.

OFFICERS AND COMMITTEES OF THE LOUISIANA
VETERINARY MEDICAL ASSOCIATION.

E. Pegram Flower, President, Baton Rouge, La.

E. I. Smith, Secretary-Treasurer, Baton Rouge, La.

COMMITTEE ON ARRANGEMENT.

E. I. Smith, Chairman; Thomas J. Hill, New Orleans Association of Commerce, W. H. Dalrymple, R. W. Tuck, E. P. Flower, A. W. Vornheder, J. Arthur Goodwin, J. R. Upton, F. J. Cambon.

COMMITTEE ON PROGRAM, BADGES AND ENTERTAINMENT.

F. J. Douglas, Chairman; Thos. J. Hill, New Orleans Association of Commerce, Hamlet Moore, Frank Collins, E. A. White, H. G. Patterson, D. H. McLean, F. S. Hewitt, Claude Sevy.

SUB-COMMITTEE ON FINANCE.

F. J. Cambon, Chairman; E. P. Flower, A. W. Vornheder.

PROGRAM.

MONDAY, NOVEMBER 17, 1919, 10 A. M.

Main Auditorium.

Called to order by President V. A. Moore.

Welcome on behalf of the State of Louisiana—Governor Ruffin G. Pleasant.

Welcome on behalf of the City of New Orleans—Mayor Martin Behrman.

Welcome on behalf of the Louisiana State Board of Health—Dr. Oscar Dowling, President.

Response—Dr. John Adams.

President's Address—Dr. V. A. Moore.

Presentation and Adoption of Minutes of Previous Meeting.

MONDAY, 1:30 P. M.—MAIN AUDITORIUM.

Report of Executive Board.

Election of New Members.

Report of the Secretary.

Treasurer's Report.

Editor's Report.

Reports of Committees.

MONDAY EVENING—PRESIDENT'S RECEPTION.

TUESDAY, NOVEMBER 18, 1919, 9:30 A. M.

Section on General Practice—Main Auditorium.

Intussusception of Intestines—Dr. J. N. Frost, Ithaca, N. Y.

Cæsarian Section in the Sow—Dr. J. N. Gould, Worthington, Minn.

Surgical Phases of Army Veterinary Work in France—Maj. George B. McKillip, Chicago.

TUESDAY, NOVEMBER 18, 1919, 9:30 A. M.

Section on Sanitary Sciences and Police—Gold Room Mezzanine Floor. Symposium on Infectious Equine Anemia.

(Swamp Fever).

Experimental Transmission of Swamp Fever or Infectious Anemia by Means of Insects—Prof. John W. Scott, Laramie, Wyoming.

Swamp Fever—Dr. Seymour Hadwen, Ottawa, Canada.

A Comparative Study of the Long Bones in Infectious Equine Anemia and Other Conditions—Dr. Lewis H. Wright, Reno, Nevada.

Changes in the Irregular Bones—Dr. L. E. Day, Chicago, Illinois.

Discussion:

Opened by Dr. C. P. Fitch, St. Paul, Minn., who will touch upon the geographical distribution, as well as certain pathological aspects of the disease.

Swamp Fever in the North—Dr. A. F. Schalk, Agricultural College, North Dakota.

Swamp Fever in the South—Dr. E. M. Ranek, Agricultural College, Miss.

TUESDAY, NOVEMBER 18, 1919, 1:30 P. M.

General Session, Auditorium.

Report of Executive Committee.

Election of Officers.

Evening.

B. A. I. and College Alumni Meetings.

WEDNESDAY, NOVEMBER 19, 1919, 9:30 A. M.

General Session, Auditorium.

Reports of Committees.

Report Special Committee on Abortion Disease—Dr. A. Eichhorn.

White Scours or Calf Scours—Drs. W. L. Williams, H. A. Hogan, and C. M. Carpenter, Ithaca, N. Y.

Bang Disease or Abortion Disease; Its Handling by the Practitioner—Dr. J. F. Devine, Goshen, N. Y.

Heredity as Expressed by our Stallion Registration Laws—Dr. W. H. Welch, Lexington, Illinois.

Sheep Practice—Dr. E. T. Baker, Moscow, Idaho.

Ulcerative Lymphangitis—Dr. E. A. Watson, Lethbridge, Alberta.

Deficiency Diseases of the South—Dr. C. A. Cary, Auburn, Alabama.

WEDNESDAY, NOVEMBER 19, 1919, 1:30 P. M.

General Session, Auditorium.

The Army Veterinary Service.

The U. S. Army Veterinary Corps, Service of the Interior—Col. C. J. Marshall, Philadelphia, Pa.

The U. S. Army Veterinary Service in France—Col. H. E. Bemis, Ames, Iowa.

The British Army Veterinary Service—Col. D. S. Tamblyn, Regina, Sask.

The United States Army Meat Supply—Maj. Geo. Lytle, Chicago, Illinois.

Some Aspects of the Army Veterinary Corps—Dr. W. H. Hoskins, New York City; Discussion Opened by Col. D. S. White and Col. L. A. Merillat.

WEDNESDAY, NOVEMBER 19, 1919, 8:00 P. M.

The U. S. Army Veterinary Activities in the U. S. and Abroad—Films and Slides Supplied by Surgeon General's Office.

1. Veterinary Hospital, St. Naziare, France.
2. Veterinary Hospital No. 6, Neuf Chateau, France.
3. Veterinary Hospital, Remount Depot, Givers, France.
4. Meat Inspection (Italian Beef), Port of New York.
5. Meat and Dairy Inspection, Chicago, Ill.

Lieut.-Col. R. J. Stanclift, assistant director of the Army Veterinary Corps and Major Robt. J. Foster from the office of the Surgeon-General, will represent the Army Veterinary Service at the meeting.

There will be an army exhibit of veterinary chests, official photographs, graphic charts and moving pictures.

THURSDAY, NOVEMBER 20, 1919, 9:30 A. M.

Section on Practice, Auditorium.

Impaction in the Horse—Dr. H. A. Trippeer, Walla Walla, Wash.

The Purpose and Scope of Veterinary Extension Work—Dr. L. C. Kigin, Lafayette, Indiana.

Additional Observations on Tuberculin Testing—Dr. W. H. Turner, New Hope, Pa.

Malignant Catarrhal Fever—Dr. T. E. Munce, Harrisburg, Pa.
The Occurrence of Epithelial Tumors in Domesticated Animals,
Illustrated—S. A. Goldberg, Ithaca, N. Y.

THURSDAY, NOVEMBER 20, 1919, 9:30 A. M.

Section on Sanitary Sciences and Police—Gold Room.

Session devoted to topics of interest to B. A. I. Veterinarians.

Remarks: Early Days of the B. A. I.—Dr. V. A. Moore, Ithaca, New York.

Importance of Preparedness in Meeting Future Outbreaks of Foot and Mouth Disease—Dr. John R. Mohler, Washington, D. C.

Tuberculosis Eradication—Dr. J. A. Kiernan, Washington, D. C.
Meat Inspection and Its Value as a Safeguard to Public Health
—Dr. R. W. Tuck, New Orleans, La.

The Sanitary Production and Handling of Milk—Dr. F. J. Cambon, New Orleans, La.

THURSDAY, NOVEMBER 20, 1919, 9:30 A. M.

Section on Veterinary Colleges and Examining Boards.

Dr. R. C. Moore, Chairman, Dr. C. D. Wall, Secretary.

THURSDAY, NOVEMBER 20, 1919, 1:30 P. M.

General Session, Auditorium.

Reports of Committees.

Session Devoted to Diseases of the South.

Economic Production of Hogs in the South—Prof. Dan. T. Gray, Raleigh, N. C.

Parasitic Diseases in their Relation to the Livestock Industry of the Southern United States—Drs. B. H. Ransom and M. C. Hall, Washington, D. C.

Poisonous Plants of the South—Dr. E. D. King, Mobile, Ala.

Tick Eradication in the South—Dr. E. I. Smith, Baton Rouge, La.

Strongylidosis in Horses and Mules—Dr. P. J. Orchard, Baton Rouge, La.

Some Carriers of Anthrax Infection—Dr. Harry Morris, Baton Rouge, La.

Some Diseases Peculiar to the South—Dr. W. H. Burson, Athens, Georgia.

Insects and Their Relation to the Production of Livestock and Poultry—Dr. T. C. Bishop, Dallas, Texas.

Ladies Auxiliary, Room E, Mezzanine Floor.

Opening Prayer—Mrs. N. S. Mayo.

Address of Welcome—Mrs. W. H. Dalrymple.

President's Address—Mrs. W. H. Hoskins.

(Date and Time to be Arranged).

Committee Reports.

Intelligence and Education.	International Committee on
Legislation.	Bovine Tuberculosis.
Neurology.	Anatomical Nomenclature.
Audit.	Veterinary Reconstruction
Resolutions.	Problems.
Budget.	Committee on Veterinary
<i>Special Committees:</i>	History.
Salmon Memorial.	Committee on Liautard Me-
Army Veterinary Service.	morial.
Unfinished Business.	

THURSDAY EVENING, NOVEMBER 20, 1919.

Banquet.

FRIDAY, NOVEMBER 21, 1919.

Entertainment. The Association will be the guest of the veterinarians of the South. Boat ride on the Mississippi river, viewing New Orleans' extensive harbor; hour of departure to be announced.

The following program has been arranged by the veterinarians of the South for the ladies:

MONDAY EVENING, NOVEMBER 17, 1919.

President's Reception.

TUESDAY AFTERNOON, NOVEMBER 18, 1919.

Trip about the City of New Orleans, visiting the French Quarter and other places of interest.

WEDNESDAY AFTERNOON, NOVEMBER 19, 1919.

Card party and luncheon at the Southern Yacht Club.

LADIES AUXILIARY.

OFFICERS

President—Mrs. W. Horace Hoskins, New York City.

Recording Secretary—Mrs. Chas. E. Cotton, Minneapolis, Minn.

Corresponding Secretary—Mrs. Ashe Lockhart, Kansas City.

Treasurer—Mrs. H. B. Cox, Philadelphia.

PROGRAM

Opening Prayer—Mrs. N. S. Mayo, Chicago.

Address of Welcome—Mrs. W. H. Dalrymple, Baton Rouge.

President's Address—Mrs. W. H. Hoskins.

HOTEL RATES.

An unfortunate rumor seems to have gained currency among some members of the Association to the effect that the New Orleans hotels are given to charge extortionate rates during conventions or other large gatherings of people, and letters have been received by THE JOURNAL office making inquiry as to the truth of the rumor.

The matter was at once taken up with The Grunewald, which is to be the headquarters of the A. V. M. A. meeting, and the following is a copy of the reply received, by Dr. E. I. Smith, chairman of the local Committee of Arrangements, from the management of the Hotel:

“THE GRUNEWALD,

New Orleans, October 7, 1919.

Dr. E. I. Smith,
603 Roumain Building,
Baton Rouge, La.

Dear Doctor:

Very sorry indeed we were delayed in replying to your letter of September 26th. I cannot understand why there should be any uneasiness on the part of any of the members of your Association, in so far as rates are concerned. The rates as published in THE JOURNAL give the minimum charge. However, you can readily realize that this does not indicate that all our rooms rent at this price.

We had not quoted more than \$7.00 on any of our desirable double rooms with bath for two persons. This is not only in

keeping with the terms of other hotels, but under present conditions is a nominal charge.

I am very glad indeed that you gave us an opportunity to explain this condition, and if you have any other suggestions to offer, we will be pleased to hear from you.

Yours very truly,

THE GRUNEWALD,

(Signed) Geo. Webre, Manager."

A rumor of this kind permitted to go uncorrected would very probably have a prejudicial effect upon the attendance at the meeting, and it is hoped that the above information from hotel headquarters will entirely dispose of it.—W. H. D.

MEDICAL DELEGATES TO THE A. V. M. A.

Dr. Hector E. Bernadas, President of the Orleans Parish Medical Society, New Orleans, has appointed the following delegates to represent the Society at the New Orleans meeting of the American Veterinary Medical Association, November 17th to 21st, 1919: Drs. Paul J. Gelpi, W. H. Robin, W. H. Seeman.

UNDER PIER THREE WEEKS, ARMY HORSE LIVES.

When Captain E. A. Small, of the Bay Ridge Army Supply Base, Brooklyn, was walking on Pier 1 at the base he heard a horse neigh under the pier. Investigating he found standing on the pier beams an army mount that jumped into the bay three weeks ago.

The horse belongs to the First Division. It was to have been shipped to Washington to take part in the Pershing parade. After the horse was warmed and fed it was as spry as ever. The army authorities are mystified as to how the horse survived so long.— *From the New York American.*

Dr. B. C. Parker, who has been located at Kansas City, Mo., is now at Kodiak, Alaska.

Dr. H. W. Gardner, formerly of Oakland, Iowa, is now practicing at Creighton, Nebr.

Dr. John Enama has removed from Lake City, Minn., to Goodhue, Minn.

OTHER ASSOCIATIONS.

IOWA VETERINARY ASSOCIATION.

ANNOUNCEMENT.

The 32nd Annual Meeting of the Iowa Veterinary Association will be held in Des Moines, Iowa, at the new Hotel Savery 111, January 13, 14, and 15, 1920.

Arrangements are now well under way, and the officers are planning to make this meeting the best ever, which bespeaks something when the success of previous Iowa meetings is considered.

H. D. BERGMAN, Secretary.

KENTUCKY VETERINARY MEDICAL ASSOCIATION.

Dr. Harry Gieskemeyer, Secretary, sends THE JOURNAL a copy of the program of the Annual Meeting of the Kentucky Veterinary Medical Association, held at the University of Kentucky, June 18-19, and he reports that it was the largest and best ever held by the Association, there being practically every veterinarian in the State present.

The program contained the following topics for discussion: Differential Diagnosis of Swine Diseases and Treatment, by Dr. Harry Gieskemeyer, and was discussed by Drs. E. A. Cahill, Pitman-Moore laboratories; T. P. Polk, Assistant State Veterinarian of Kentucky; and Carl H. Beyer, Henderson, Ky.

Hog Cholera and the Swine Industry, by Dr. U. G. Houck, B. A. I.

Infectious Abortion, by Prof. E. A. Good, Ky. Agri. Expt. Station.

Value of the Stomach Tube in Treating Digestive Disorders, by Dr. Chas. H. Mainhart, Richmond, Ky. Discussion by Drs. Jas. B. Shannon, Lexington, Ky.; Geo. W. Pedigo, Glasgow, Ky.; and W. Boyd Robinson, Mt. Sterling, Ky.

There was also a live clinic, including Demonstrations and Technic of Hog Cholera Vaccination.

Secretary Gieskemeyer also favored THE JOURNAL with the manuscript of a paper on The Relationship between the Veteri-

narian and the County Agent, by Dean Cooper, Agri. Expt. Station, Lexington, which appears in another part of this issue of THE JOURNAL.

OREGON AND WASHINGTON VETERINARY MEDICAL ASSOCIATION.

The Oregon-Washington Veterinary Medical Association met in joint session at Tacoma, Washington, on August 7, 8 and 9. Headquarters were at the Hotel Tacoma. Both states were well represented and the meeting was one of unusual interest.

Doctor Wilson of the Board of Health of Tacoma welcomed the veterinarians to the city with a most timely address. Doctor J. W. Cook of Brownsville, Oregon, responded in his usual pleasing manner.

The first paper was by Doctor C. S. Phillips of Mount Vernon, Washington. It was entitled, "Obstructions of the Cow's Teat." Good results had followed surgical manipulation in about 50 per cent of his cases. This paper brought out a very good discussion. Several of the practitioners who are located in the dairy sections seem to think that the cow's teat can be manipulated surgically with better chance of favorable results than most veterinarians have believed in the past.

The next paper was by Doctor F. W. Miller of Corvallis, Oregon, on Laboratory Diagnosis. He emphasized the precautions which the veterinarian in the field must take in collecting and forwarding material in order to obtain optimum results from laboratory examination. From the discussion which followed it appeared that many of the men in the field are anxious for laboratory help, especially diagnosing hemorrhagic septicemia and diseases exhibiting similar symptoms.

Doctor W. G. Morehouse of Salem, Oregon, read a paper entitled "A Partial Paralysis in Cattle." He brought out the symptoms and results of treatment of cows which are affected with a disturbance showing some resemblance to parturient paresis. He attributed these cases to disturbances of the digestive system. Several other practitioners reported having treated somewhat similar cases.

The next paper was by Doctor E. E. Wegner of Pullman, Washington. It was entitled "An Analysis of 6500 Cases."

This was a critical analysis of a practice covering a period of 10 years. Doctor Wegner showed that a relatively small number of diseases make up the major portion of a practice.

Doctor R. G. McAllister of Corvallis, Oregon, read a case report "Amputation of the Penis in a Gelding." Possibly the most interesting point was the fact that the horse escaped from the stall after the operation and was not located for several days. When found he seemed to be doing so well that it was decided not to interfere with the wound in any way. The animal made a satisfactory and uneventful recovery.

Mr. Scott of the Marine Products Company gave a very interesting talk on fish meal as a food for cattle. The next paper was by Doctor C. J. Sandwith of the Bureau of Animal Industry on "The Attitude of the Bureau Man Towards the Practitioner."

Doctor R. J. Donohue, Chief of Division of Dairy and Livestock, State Department of Agriculture, Olympia, Washington, gave a very interesting talk upon legislation affecting veterinarians. He emphasized the fact that the practitioner is usually not in very close touch with the legislature when bills in which veterinarians are interested are introduced.

The next paper was by Doctor Clifford Ackley of Centralia, Washington. The subject was "Livestock Sanitation and the Public Health." This was very well received and a good discussion followed.

Doctor W. H. Lytle, State Veterinarian of Oregon, read a paper on "Mixed Infection of Cattle." He reported rather serious losses in some sections of Oregon from a disease that seemed to be the result of infection with the hemorrhagic septicemia group of bacteria combined with other organisms. This proved to be a very live subject. Many of the practitioners joined in the discussion.

The next paper was "Some Observations Concerning Abortion Disease" by Doctor B. T. Simms, Corvallis, Oregon.

On the night of August 8 a banquet was held in the Hotel Tacoma. Doctor E. E. Wegner was a most capable toastmaster.

The two associations decided to meet together again in 1920, selecting Portland, Oregon, as a meeting place. The date of the meeting was not definitely decided but it will very probably be some time during the first two weeks of August.

The following officers for the ensuing year were elected by the Washington association: Doctor Walter Ferguson of Goldendale, President; Doctor R. A. Button of Tacoma, Vice-President; Doctor Carl Cozier of Bellingham, Secretary-Treasurer. The new officers of the Oregon Association are Doctor Roy Smith of Eugene, President; Doctor W. B. Coon of Forest Grove, first Vice-President; Doctor C. M. Gardner of Portland, second Vice-President; Doctor F. W. Miller of Corvallis, third Vice-President; Doctor B. T. Simms of Corvallis, Secretary-Treasurer.

B. T. SIMMS.

GEORGIA STATE VETERINARY ASSOCIATION.

The thirteenth annual meeting was held in the parlors of the Tosco Hotel, Thomasville, Ga., on Sept. 18th and 19th.

It was the liveliest and best attended meeting in the history of the association.

The following program was carried out.

President's Annual Address, Dr. G. Darbyshire, Donaldsonville.

Secretary's report, Dr. Peter F. Bahnsen.

Recent Legislation and its influence on the Veterinary Practitioner, Dr. Darbyshire. This paper dealt particularly with the recent law passed by the Georgia Legislature authorizing and requiring the State Veterinarian to select and train a number of laymen in each county for the purpose of administering the simultaneous treatment for hog cholera, and after a period of training to issue permits to these men. The subject was discussed by Dr. Peter F. Bahnsen, Dr. W. M. Howell, Dr. R. M. Walsh and others. It was the consensus of opinion that this was a particularly vicious piece of legislation which should not have been permitted to be placed on the statute books. That it would likely seriously injure veterinary practice in many of the counties in which hog raising is important and very probably result in an increase in the losses from cholera and other swine diseases. On account of the fact that the bill was introduced from Lowndes County, the home of Dr. W. M. Howell, there was some effort made to place the responsibility for it upon the shoulders of Dr. Howell, who claimed absolute ignorance of the fact that such a bill was to be introduced until after it had been

introduced. Dr. Bahnsen, State Veterinarian, claimed that he made all efforts possible to defeat the bill, by having inserted into it a provision calling for an appropriation of \$40,000, which he hoped would result in its defeat. This, however, failed to defeat the bill.

Differential Diagnosis of Swine Diseases, by Dr. O. B. Hess, was next on the program. The paper was discussed by Dr. W. E. White, Dr. S. J. Rayfield, Dr. A. L. Hirleman, Dr. W. M. Burson and others.

This subject is one that has been popular at association meetings for some time and nothing new was brought out which would enable any one to draw a clear line of demarkation between Hog Cholera, Swine Plague, Infectious Pneumonia, Mixed Infections and Hemorrhagic Septicemia.

The Value of Bacterins in Swine Diseases, by Dr. C. Pedrick. Discussion by Dr. R. S. Duffel, Dr. D. L. Proctor, and others. Conflicting reports were made as to the results obtained through the use of bacterins. Several reported good results in stopping "breaks" following the simultaneous treatment.

This ended the program for the first day and was followed by a delightful barbecue and musical entertainment for the benefit of the veterinarians, tendered by Judge Roscoe Luke of the Court of Appeals at his beautiful and commodious home in the suburbs of Thomasville. Violin music by Dr. J. Goldbrown was an important feature of the evening's entertainment, which was thoroughly enjoyed by all.

The following program was carried out on the 19th:

"Regulations Governing Interstate Shipment of Animals," by Dr. W. W. Parrish. In the absence of Dr. Parrish this subject was handled by Dr. W. M. MacKeller, Inspector in Charge of Tick Eradication for Georgia. Information concerning new methods of certifying to shipments accompanied by certificate of tuberculin test was fully given, as well as explicit directions for the handling of other shipments.

"Intrastate Shipments" was discussed by Dr. P. F. Bahnsen, and especial attention called to Regulations Governing the Transportation of Hogs within the State of Georgia and the shipment of cattle from territory quarantined on account of tick fever.

"What's the Matter with the Cattle Practice" was the title of a paper by Dr. H. A. Romine. Discussions by Dr. J. W.

Salter and Dr. W. A. Downs. It was brought out that there was but little the matter with cattle practice in general but that on the other hand cattle practice was usually satisfactory. The most serious problem appeared to be in connection with hemorrhagic septicemia, "mad itch," "rubbing disease" and forage poisoning. There was considerable difference of opinion as to the cause and nature of the condition described as "mad itch" and "rubbing disease." Some believed it to be a form of hemorrhagic septicemia. Dr. Bahnsen advanced the idea that it is a cryptogamic forage poisoning. Dr. Burson offered the use of all facilities of the Veterinary Division, State College of Agriculture, in the efforts to be made to determine the true nature of the disease.

"The Relation of the County Agent to the Veterinary Practitioner" was the title of a paper assigned to Dr. W. M. Burson of the State College of Agriculture at Athens.

Dr. Burson announced that he was not a volunteer but had been drafted by the program committee to discuss the above subject. He explained the whys and wherefores of the establishment and maintenance of Agricultural Colleges and the reasons for the carrying on of agricultural extension work by the Federal Department of Agriculture, the State and County in coöperation. Briefly, that the function of the College is to aid the farmer to be more prosperous and to have a better home for himself and family and to help him in the increasing of production of food-stuffs and other agricultural products, that the nation might be fed and clothed. He called attention to the fact that irrespective of profession, men engaged in the work carried on by agricultural colleges must bear the fact in mind that the function of the college is to aid the farmer. He then read to the association a paper which he had read to a State Meeting of County Agents at the State College of Agriculture in January, 1918, entitled "The Work of County Agents in Dealing with Diseases of Animals." In this paper he brought out the point that there is much that county agents may do along this line without interfering with the veterinary practitioner. That as a rule the farmer overestimates the abilities of the county agent to deal with diseases of animals and that often the agent also overestimates his own abilities in this direction. He advised the agents to study anatomy and physiology of farm animals, read the Bulletins of the Department of Agriculture, State Colleges

of Agriculture and Experiment Stations, familiarize themselves with the symptoms of common diseases and parasitic diseases. Point out to the farmers the value of pasture rotation, sanitation, cleaning and disinfection and the proper disposal of carcasses. To inform farmers concerning the regulations of the State Veterinarian and State laws governing the control of animal diseases and the transportation of animals and to impress upon them the importance of the faithful observance of these laws and regulations. To aid, educationally, in tick eradication. To assume no authority along this line. To report to the State Veterinarian all new outbreaks of contagious diseases and to call upon the State Veterinarian for help when it was apparent that help was needed. To not undertake work which properly belongs to the practitioner and to strive to bring about a closer relationship between the farmer and local veterinarian, as a feature of the agent's educational work. To have nothing to do with the tuberculin test or simultaneous treatment for hog cholera but to refer farmers to local practitioners or to the State and Federal veterinarians engaged in this work. To give their public to distinctly understand that they were not veterinarians but willing to be of service wherever possible in counties in which veterinary service is not available. To use care as to diagnosis and treatment, avoid the use of poisonous or otherwise dangerous drugs, and in the absence of accurate diagnosis to do nothing. To attempt no surgery but to refer the farmer to the nearest practitioner.

Following the reading of this paper a few brief remarks were made by Dr. W. W. Webb, Dr. W. A. Downs and others, on the subject. No fault was found as to the position taken by Dr. Burson in the matter. On the other hand it was pointed out that one practitioner in the state had arranged for a county agent to obtain hog cholera virus in the name of the practitioner, thereby enabling the county agent to use the simultaneous treatment.

The coming meeting of the A. V. M. A. at New Orleans was brought to the attention of the meeting on several occasions and all were urged to drop business, take their competitors with them, and attend the meeting. Many present signified their intentions to attend.

Under the head of new business, Dr. Burson invited the Association to hold the next annual meeting at the Veterinary

Division, State College of Agriculture, at Athens. The invitation was unanimously accepted by a rising vote.

A committee on resolutions was appointed to draft resolutions of sympathy and condolence on the deaths during the past year of Dr. D. E. Pace and Dr. A. M. Rettig.

Officers for the following year elected were: President, Dr. H. A. Romine, Montezuma, Ga.; Vice-President, Dr. S. J. Rayfield, Camilla, Ga.; Secretary-Treasurer, Dr. W. M. Howell, Valdosta, Ga.

Following adjournment an interesting clinic was held at the hospital of Dr. J. C. Schwencke. A number of interesting cases were examined. Two pigs were "posted" for diagnostic purposes and numerous forms of parasitism found. Treatment for sterility in cattle was demonstrated by Dr. Schwencke.

All in all it was the best meeting ever held by the Georgia State Veterinary Association.

W. M. BURSON,
Res. Sec. for Georgia.

NORTH-WESTERN ILLINOIS AND SOUTH-WESTERN WISCONSIN VETERINARY MEDICAL ASSOCIATION.

The first annual meeting of this association was held at Freeport, Illinois, October 8th and 9th, 1919, at which a very interesting program was presented.

The meeting was called to order by President B. F. Swingley, Freeport, Ill., after which Mayor Calkins, of Freeport, delivered an address of welcome, which was responded to by Thos. P. Brankin.

Then followed the President's Address; the Report of the Secretary-Treasurer, Roy E. Kluck, Forreston, Ill., and the reports of the various committees.

Among the papers presented and discussed were, Sterility of Cattle and Its Treatment, by J. G. Jones, Oregon, Ill.; Metritis in the Cow, by I. W. Perry, Warren, Ill.; My Conceptions of what the Relations between the Veterinarian and the Farm Adviser should be, by G. F. Baumeister, Farm Adviser of Stephenson County Farm Bureau, Freeport, Ill.; Hemorrhagic Septicemia of Cattle, the Different Forms I have met, and the Results I have obtained, by Roy E. Kluck, W. H. Parkinson,

Mount Carroll, Ill., and T. E. Lotz, Chadwick, Ill.; *Some Useful Veterinary Medicines*, by N. S. Mayo, Chicago.

Heat Prostration, by J. D. Corson, Leaf River, Ill.; *Eversion of the Uterus*, by Dr. Heer, Platteville, Wis.; *Mixed Bacterial Infections—Treatment and Prevention*, by E. K. Glover, Kansas City, Mo.

Case Reports on Mixed Infection in Swine and Discussions, by F. D. Yeager, Lena, Ill., W. P. Stattler, Lanark, Ill., C. R. Rosenstiel, Freeport, Ill., C. W. Swingley, Freeport, Ill., and H. E. Erickson, Milledgeville, Ill.

An instructive clinic was held at the hospital of Dr. Swingley.

A banquet was held on the evening of the 8th, and among the speakers were Col. L. A. Merrilat, Drs. N. S. Mayo, and E. K. Glover, and others.

SOUTHEASTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION.

The regular quarterly meeting of the Association convened at the Griswold Hotel, Detroit, Wednesday afternoon, October 8, 1919, with twenty members and visiting veterinarians in attendance.

The afternoon session was devoted to a round-table discussion of various topics. Among these was the sale of goat meat for mutton in Detroit, which had recently received quite an airing in the newspapers. Dr. H. E. States, Chief Veterinarian of the Detroit Board of Health, stated that there was no municipal ordinance under which the sellers of goat meat could be prosecuted, so long as the meat was properly inspected and was in good condition.

The subject of live stock insurance was thoroughly discussed, and it seemed to be the opinion that insurance of this kind was a good thing, provided the company was reliable. It also appeared to be the opinion of those present that it was perfectly proper for a veterinarian to connect himself with such companies in a professional capacity.

An outbreak of stock yards pneumonia was reported, and Dr. Dunphy, State Veterinarian, was asked to explain the position of the state sanitary officials with reference to quarantining

cattle affected with the disease, or preventing the shipment of affected cattle into the State. Dr. Dunphy explained that it had not been found practical to do this, owing to the fact that animals rarely showed any signs of the disease until after they had reached their destination and been unloaded.

Dr. Dunphy was also asked to explain the system of reimbursement of owners of cattle destroyed for tuberculosis, in connection with the Federal tuberculosis-free accredited herd plan, where both the State and Federal Governments provided for compensation. It was shown that owners frequently received practically full value for pure-bred animals.

An outbreak of hog cholera was reported, in which part of a healthy herd of hogs, in uninfected territory, had been given the serum-virus treatment. Cholera appeared shortly afterwards among the hogs which had not been vaccinated, practically all of them contracting the disease. It was a splendid example of the inadvisability of using virus in a healthy herd unless the entire herd is immunized. This outbreak was especially unfortunate because this particular herd was the only herd in the neighborhood to be vaccinated, and the first one to be attacked with cholera.

Adjournment for supper took place at 6:30 and the meeting was reconvened at 7:30 p. m., for the reading of papers.

Dr. R. P. Lyman, of East Lansing, read a paper entitled "Septic Infections of New-born Animals." This was a very scholarly paper and gave the latest views on the pathology and bacteriology of white scours, calf pneumonia, arthritis, omphalophlebitis, etc. The author paid special attention to the treatment of these diseases, hygienic, medicinal and biological. Reasons for the success and failure of different bacterins and serums were recounted.

Dr. R. H. Wilson, of Rochester, presented an interesting paper on "Thrombosis and Embolism." After going very thoroughly into the pathology of these conditions, the author presented a number of case reports, with autopsy findings. This paper was followed by a report, by Dr. S. Brenton, of Detroit, of the successful treatment of a case of embolism of the iliac artery. The subject, a hunter, had been examined by Dr. Brenton and a diagnosis of embolism made. This was confirmed by Dr. R. W. McCully, who was called from New York City to

Detroit, in consultation. The case was regarded as incurable, but the owner insisted that the horse be given a chance to live, and Dr. Brenton was asked to do anything that might be done for the animal. Treatment was started by bleeding the patient from the jugular, about two liters of blood. Then an intravenous injection was given consisting of about four liters of physiological salt solution containing 6 mls of formalin. This treatment was repeated once each week for six or seven weeks. Marked improvement was noted, and apparently a complete recovery was made. The animal is alive and shows no symptoms of the former trouble, even when subjected to the rather violent exercise incident to hunting.

Dr. T. F. Krey, of Detroit, then read a paper on "Tetanus." The author paid special attention to the use of tetanus antitoxin, having made a special study of the dosage and method of administration employed by veterinarians who were extensive users of antitoxin. Dr. Krey laid special emphasis on the importance of the early administration of large doses, rather than to string out the injections of the same amount of serum over a number of days. He also spoke of the good results being obtained with the intraspinal injections of serum, explaining in detail just how these should be made.

Dr. L. A. Maze, of Pontiac, addressed the meeting on the subject of "Autogenous Vaccines in the Treatment of Bovine Mastitis." Stock bacterins used by Dr. Maze had failed to give satisfactory results, so he prepared a vaccine from the udder secretions of each case. Directions for preparing these vaccines were given. Some cases appeared to respond satisfactorily to this treatment, while others were not benefited.

All the papers were very thoroughly discussed, and the members present voted the meeting the best one ever held by the Association.

H. PRESTON HOSKINS, Sec.

FIRST TUBERCULOSIS-ERADICATION CONFERENCE.

The conference, called by the Federal Bureau of Animal Industry to meet at Chicago, October 6 to 8 to discuss the problem of tuberculosis eradication was the first of its kind, and 158 delegates from various parts of the country were

in attendance. In opening the meeting Dr. John R. Mohler, chief of the bureau, emphasized the importance of conducting disease eradication in a manner that is practical and workable as well as being scientifically correct. Likewise he announced the desire of the Federal Government to receive information from all sources to supplement the work of the U. S. Department of Agriculture investigators. A problem of considerable importance is the tuberculin testing of cattle at public stock yards. Such testing is aimed to check traffic in diseased animals and to protect communities which have little bovine tuberculosis from infection by cattle that are diseased or of doubtful health. This condition applies especially to dairy stock and to breeding cattle, but in preventing interstate movement of tuberculous animals, live-stock sanitary officials recognize the need for doing the work in the most expeditious manner.

In addition to the subcutaneous test, which has been the most widely used in detecting tuberculosis in live stock, two other tests—the intradermal and ophthalmic—received close study and discussion. The intradermal test, in the experience of many of the delegates, is especially useful in testing range cattle and those which are unaccustomed to handling. It has a field of usefulness, likewise, in very hot or very cold weather when the atmospheric temperature makes difficult an accurate diagnosis with the subcutaneous test, which depends on a series of animal-temperature readings.

The ophthalmic, or eye test, is another means of diagnosing tuberculosis. This test is applied to one eye, the other being left untreated for comparison, and a characteristic appearance indicates whether the disease is present. The eye test thus far has been used chiefly in combination with the other tests or as a means of obtaining further evidence on suspicious cases. The discussion indicated the usefulness of all three tests in detecting tuberculosis in live stock, and when used in combination the tests appear to be an almost unfailing means of diagnosing the disease. As a supplement to the conference, experimental testing by the three methods was conducted at the Union Stockyards.

Delegates from all parts of the country reported keen interest in their localities in the so-called accredited-herd plan, under which the Federal and State authorities grant a certificate to owners of herds found to be free from tuberculosis and which

are maintained in a prescribed manner. The principle of the plan was warmly endorsed as a constructive means of tuberculosis eradication, and the conference favored its continuance along present lines or with additional requirements that will increase its effectiveness. A topic receiving special emphasis was the need for painstaking and thorough disinfection of premises where disease has been found, followed by continuous attention to sanitation of buildings and surroundings.

Eradicating tuberculosis from cattle will practically solve the problem of controlling the disease among swine. That was the opinion of veterinary experts experienced in the handling and postmortem examination of swine received at the principal market centers. By means of a simple and practical marker, hogs may be tattooed with distinguishing letters and figures, and when disease is found by postmortem examination, the identity of such animals is known. With a simple system of records it is thus possible to trace a shipment to the farm from which it came and stamp out infectious diseases at their source. The evidence submitted showed that swine became infected with tuberculosis, principally from cattle, either by following them in feed lots or pastures, by receiving infected dairy by-products or by eating tuberculous carcasses. In addition there are numerous other but less common methods by which swine contract tuberculosis.

The discussions revealed a wide difference of conditions and problems, many of them intricate, but there was unanimous agreement on the main topic—to eradicate tuberculosis from live stock throughout the United States and to do it at the earliest possible time. Farmers and stockmen of the country virtually have set a pace in their demands for testing that is faster than was anticipated a few years ago, but the live-stock sanitary officials are not to be outdone. The Federal Bureau of Animal Industry is now producing about three times as much tuberculin as a year ago, and it is being distributed free to Federal, State, county and municipal officials. Those in charge of the work in different States recognized that the present progress is but a beginning, and to avoid confusion there must be uniform policies and methods. They stressed also the importance of doing the work thoroughly and well, so there will be no reaction and loss of confidence.

Live-stock owners may be of great immediate assistance in the work, with much benefit to themselves, if they will isolate all

animals brought into their herds until such animals are definitely known to be healthy, and also will maintain clean and sanitary surroundings. The gradual increase in the number of live stock in the United States and also in the shipment and exchange of animals make disease control and eradication a problem demanding the closest coöperation among live-stock owners, sanitary officials and the public in general. The regulations which have been found necessary are directed, the conference showed, at a small minority of conscienceless people who, if unchecked, would spread disease all over the country. In addition many of the provisions regarding handling of live stock in interstate traffic are a check on carelessness or indifference to public welfare. It is believed that the great majority of live-stock men, knowing these facts, will support regulations which are aimed to correct the conditions.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

OCTOBER MEETING, 1919.

The regular monthly meeting of the V. M. A. of New York City was held in the lecture room of Carnegie Laboratory, 338 East 26th Street, Wednesday evening, October 1st, at 8:30 p. m., President Cochran presiding. The minutes of the June meeting were read and approved. Dean Hoskins read an interesting and profitable paper on "America's danger in the new world battle for food." The Dean reviewed the appalling destitution which had accompanied the war, and the remaining hunger problem which is facing the world today, which promises to remain permanent, due to the wasteful neglect of the proper development of the source of food supply in our own country. As a remedy the Dean offered two suggestions. First: that Community abattoirs and food conservation stations should be established. Second: that the exportation of food products should be restricted, so that the price levels in this country will fall within the reach of the average family. The application of these principles would reduce the price of meat 25% in addition to multiplying greatly the supply of other foods whose productivity depends so largely upon animal industry. The Dean's paper was followed by an animated discussion.

Reports of Delegates to the New York State Meeting—Dr. Gannet reported on the obscure case of colic exhibited at the meeting. History: persistent pains, loss of appetite, no temperature, died on tenth day. Post mortem: infected cæcum peritonitis and a rupture of the cecal valve. Quittor operated on by Dr. Frost, did well for three weeks, then pus and severe lameness developed; put on table and after re-operation made good recovery. Umbilical hernia case operated on by Dr. Frost did not do very well but a re-operation was very successful. Drs. Slawson, McKinney and Berns discussed these cases. Dr. Eichhorn, reporting on the trip to the Lederle Antitoxin Laboratories, Pearl River, New York, said it was always a pleasure to have veterinarians shown through the establishment. The Doctor also commented on, and explained, the dilution method in inoculating animals against rabies. Under this method only six injections are necessary, two on first day and one on each four following days, the cost being six dollars for the treatment.

Dr. Ellis reporting for the committee on the twenty-fifth anniversary reunion said they had decided on Thursday, October 23rd, 8 p. m. Place of meeting was not settled yet, but it had been arranged to divide the cost pro rata on the attendance at the dinner. On case reports, Dr. McKinney reported that he had a number of horses lately suffering from cramp in the hind legs following shipping fever and influenza. In his opinion this was due to inflammation of the sciatic nerve and treated them with hot applications, liniment and purge, but he had three cases which persisted after three weeks of treatment. Dr. Berns in discussing these cases said he believed they were due to a luxation of the patella, Drs. Cochran and Gannet also joining in the discussion. Dr. Ellis reported a similar case in a cow in Brooklyn which he treated successfully by applying a sharp liniment. The following questions were then asked: Why is a slate or dun colored horse always hardy? Why is a horse with a white mane and tail always delicate? Why is a mule-footed horse not subject to corns? Why is a horse with Roman nose always stubborn? Why do mules not breed? Drs. Devine, Cochrane, Ellis and Dean Hoskins with other members joined in discussing these questions.

No further business appearing, the meeting adjourned.

J. ELLIOTT CRAWFORD,

Secretary.

NECROLOGICAL.

DR. CHAS. S. COLSON.

Dr. Chas. S. Colson, a graduate of the McKillip Veterinary College, and an Inspector in the Bureau of Animal Industry, died on July 2, 1919. Dr. Colson joined the American Veterinary Medical Association in 1918.

DR. W. W. PARRISH.

Dr. W. W. Parrish, of Fitzgerald, Georgia, died suddenly at his home, on September 28th, as the result of an attack of apoplexy, at the age of 57 years. Dr. Parrish was a graduate of the Veterinary Department of the Alabama Polytechnic Institute, Auburn, Ala.

DR. HENRY BUCHANAN.

Dr. Henry Buchanan, of Thamesville, Ontario, Canada, died a short time since from internal hemorrhage. Dr. Buchanan was a graduate of the Detroit College of Medicine Veterinary School in the year 1895, and was admitted to membership in the American Veterinary Medical Association in 1916. He was in practice in Thamesville, Ontario.

MR. HARRY COLEMAN MOORE.

Mr. Harry Coleman Moore, late President of the Pitman-Moore Company, Indianapolis, Ind., died on October 6th, 1919, at the age of 45. While not a member of the Veterinary Profession, Mr. Moore was closely affiliated with it through the business of his firm as manufacturers of biologics, and for the past number of years was a regular attendant at the meetings of the A. V. M. A. Mr. Moore was well and favorably known throughout the profession, and was one of the party of prominent Veterinarians who made the trip to Europe in 1914, and was over there at the outbreak of the late war. Many of the

members may recall the active part Mr. Moore played in the successful meeting of the Association held in Indianapolis in 1912, when he seemed to be the leading spirit in the elaborate preparations that were made for the convention in that city.

We feel sure that the many friends in the profession whom Harry Moore made will deplore his premature death, and will join THE JOURNAL in sympathy for those whom he has left to mourn his loss.

FACTS AND FIGURES NEEDED IN LIVE-STOCK INDUSTRY.

Dr. John R. Mohler, chief of the Bureau of Animal Industry, United States Department of Agriculture, told the American Meat Packers' Association in session at Atlantic City that live-stock production and methods of marketing will never have any real stability until more is known about certain basic problems.

"It takes time and costs money to get those facts, but such information will be needed before there can be any real stability in live-stock production and methods of marketing. Only upon a substantial foundation of accurate knowledge is it possible to build enduring plans or policies which will have the respect of the public and become a real public service.

"The protection of public health will always be of paramount interest, but aside from that, perhaps the most important activity which I can commend to your attention is the collection of facts and figures relating to the live-stock industry. Federal Meat inspection has resulted in important information leading to the control of animal diseases. We know, for example, that tuberculosis and hog cholera cause more than one-half of all condemnations in Federally-inspected establishments. We need to know more about the condition of animals slaughtered under local inspection. We need to know the definite relation between the breeding of an animal and the value of different cuts of meat the carcass contains. I refer of course to the need for figures on large numbers of live stock. We need to know more about factors leading to rapid maturity, more about shrinkage, and more about the location of live stock and meat supplies in the country at any given time."— *Weekly News Letter*.

MISCELLANEOUS.

HORSE MEAT IS A FACT.

Much has been said during the past few years regarding the utilization of horse meat for human food. The chief arguments advanced in its favor are that horse meat is nutritious and for many years has been used in Europe; that thousands of light horses for which there is no appreciative market are consuming grass on the range that might better feed cattle and sheep; that beef, mutton and pork are scarce and high in price, and that additional hides are needed to supply leather. Men who oppose these views contend that horse meat is unsightly, unpalatable, will not keep well, and is not actually needed in America, and that the "noble horse" for esthetic and sentimental reasons should not be put to such an undignified use.

For the information of those who have not examined horse meat it may be stated that it is conspicuously dark-red or even brown in color. When exposed to the air it shows a bluish luster, and even turns blackish-red or black. Its fibers are fine, its consistency is firm, and its coverings of fascia are prominent. There is no intermixing of fat in the muscles. The odor is peculiarly sweet, and to some people almost repulsive. Its sweetness is due to the presence of glycogen, which turns to grape sugar. The fat is soft, oily and light-gold to dark-yellow in color, but in well-nourished horses it is whiter and firmer. Bone marrow is wax-yellow, greasy and soft, but becomes firmer in the air.

Horse meat is slowly but surely entering our markets and going abroad. Horses are being slaughtered in a Milwaukee plant, and a market for its sale is doing business in that city. There are similar slaughter houses and markets in other parts of the country. Other new centers for this industry are springing up. It is for the latter reasons that the United States Department of Agriculture has been authorized by Congress to inspect horse meat and horse products. An amendment to the regulations governing meat inspection was passed by Congress on July 24, providing \$100,000 to carry on the work during the fiscal year ending June 30, 1920.

Under this provision every establishment in which horses are slaughtered for the preparation of food products for transporta-

tion or sale in interstate or foreign commerce will be Federally-inspected. The slaughtering of horses, and the preparing and handling of horse meat must be done in establishments separated from those in which other animals are killed and handled. The horses to be slaughtered for meat must be examined and passed by veterinarians, as the animals must be free from a number of specified diseases, and fit for the purpose. The meat must then be conspicuously branded or labeled "horse meat" or "horse meat product," and bear the inscription "U. S. Inspected and Passed by the U. S. Department of Agriculture.—*Breeder's Gazette*.

NEWS FROM THE PHILIPPINE ISLANDS.

Through Dr. Stanton Youngberg, Resident Secretary for the Philippine Islands, Secretary Mayo has received the names of a number of applicants for membership in the A. V. M. A., all duly vouched for. These are: Honorio C. Evangelista, Frederico Jardiniano, Pedro S. Sales, Angel K. Gomez, G. F. Tottman, Segundo Alano, Santiago Montemayor, and Vincente Diaz.

In remarking upon the weather, Dr. Youngberg has the following to say: "Talk about rain, in my twelve years' residence in this country, I have not seen anything like this before. During the past 18 days (letter was dated Manila, August 12, 1919) seven successive typhoons have passed up the east coast of these islands, which have brought us plenty of wind and rain. Seventy inches of rain have fallen during the period mentioned. One day last week $2\frac{1}{2}$ inches fell in an hour. All sorts of rainfall records are being broken. Needless to say everything is flooded, and there is a great deal of suffering among the poor people. If this does not let up pretty soon, guess we will have to swim out.

"Hope my petitions may all get through, as they are a nice lot of fellows." It is to be hoped that our Filipino friends may not suffer materially from their recent excessive "moisture content."

CORNELL UNIVERSITY OFFICIAL PUBLICATION.

Number D., Volume X., of the Cornell Publication is devoted to an interesting Report of the Conference at the N. Y. State Veterinary College, which was held during the Semi-Centennial Celebration of Cornell University in June last. It is nicely illustrated and contains a number of most interesting articles, or papers, concerning veterinary medicine and its growth at Cornell. Among these may be mentioned "Half Century of Veterinary Medicine in Cornell University," by Dr. James Law, which makes most delightful reading from an historical standpoint. Dr. Simon Henry Gage devotes eight pages to a Biography of Dr. James Law, who was the first professor of veterinary science at Cornell, and who may be considered one of the fathers of the science in this country. Dr. Grant S. Hopkins gives "The Establishment and Growth of the New York State Veterinary College."

"The Problems and the Opportunities of the Veterinarian" are ably discussed by Dr. Walter L. Williams. Dean Veranus A. Moore's paper treats of "The Relationship of the Veterinary College to the State;" while "The Administration of the College and Its Needs" is discussed by Dr. Frank H. Miller; and "Buildings and Equipment" by Dr. Howard J. Milks.

As a supplement, the proceedings in connection with the presentation of Dean Moore's Portrait to the University (previously referred to in the pages of THE JOURNAL) is also given. The publication contains over 90 pages, and should form very interesting reading, not only to Cornell men, but to members of the profession in general.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF AUGUST 24, 1912, OF THE JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION (FORMERLY THE AMERICAN VETERINARY REVIEW), FOR OCTOBER, 1919.

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Managing Editor—None.

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Known bondholders, mortgagees and other security-holders, holding 1 per cent or more of total amount of bonds, mortgages or other securities—None.

W. H. DALRYMPLE, Editor.

Sworn to and subscribed before me this 2nd day of October, 1919.

SAMUEL G. LAYCOCK, Notary Public.

(SEAL)

(My commission expires March 4, 1922.)

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OF THE
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(Original Official Organ U. S. Vet. Med. Ass'n)
W. H. DALRYMPLE, Editor. **BATON ROUGE, LA.**

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A CHANGE.

At the time of writing this article, or announcement, which is previous to the annual meeting of the Association, it is not possible to say who the next editor of THE JOURNAL may be, although a change is certain. When the present incumbent of the office was elected at the Philadelphia meeting last year, the war was still going on, and many of our ablest members were called to the service, including the previous editor, Dr. P. A. Fish, whose resignation was a decided loss to our publication. And while he considered it a very high compliment and honor to be chosen to succeed Dr. Fish, he consented to accept the position during the unsettled times occasioned by the war, but with the hope and expectation that in a year or so, or after hostilities had ceased, some other member would be elected to the office and be in a position to devote more of his time to the work of THE JOURNAL, which is very much needed.

With a full program of regular duties, besides numerous other calls upon his time, the present editor realized at the time, that in assuming the editorship of THE JOURNAL, which includes the business management, he was undertaking, with limited office help, a very responsible and more or less difficult task. How-

ever, notwithstanding the increased membership in the Association, and many irregularities brought about by war conditions, he has tried to get out a reasonably presentable publication, and desires to take this opportunity to thank all those who have in any way assisted him by contributing to its support in a literary way; and at the same time ask that any discrepancies and shortcomings on his part may be overlooked, or excused, under the circumstances.

Even at the present time the work of *THE JOURNAL* is more than one individual can properly attend to whose time is more or less fully occupied with other duties; and with the growth of the Association, this will become more and more evident. However, by the time this appears in print, some change may have been made which will meet the exigencies of the case. At the same time, whatever change may be made with regard to the management of *THE JOURNAL*, the writer has not the slightest doubt but that our official organ will go on increasing in prestige and usefulness to the profession as the years pass by.

For the new editor, whoever may be chosen, the writer bespeaks the same generous assistance and support from the membership as he has received during his incumbency of the office.

W. H. D.

ADULTERATED DRUGS AND "SUBSTITUTES."

In an article appearing in a recent number of *The Breeder's Gazette*, we find that warning has been sent out by a reputable drug firm that animals are being poisoned by "fake" turpentine containing pine oil, wood naphtha, or other poisonous adulterants, which impurities are likely to be found in "turpentine substitute" intended for painting purposes. *The Gazette* very naturally suggests that stockmen should not buy turpentine for medicinal purposes at a paint store, or from any one other than a dealer in pure drugs; and also, that any drug to be given to ailing animals should be appropriate for the sickness present, unadulterated and safe, and properly administered. For these reasons, unless absolutely impossible, it is always safe to have the drug prescribed and administered by a trained veterinarian. The article also refers to the use of linseed oil obtained from a similar source, viz., the paint store, and its frequent ill effects.

We do not think there can be any question that many animals

succumb to the paint store variety of linseed oil. Many farmers who use linseed oil, medicinally for their stock, purchase it at the country store, which keeps it solely to dispose of for mixing paints, which of course is the boiled variety; and not only so, but the "bung-boiled" oil at that, which, instead of being put through the process of ebullition, has chemical agents, such as litharge, or the monoxide of lead, introduced through the bung-hole to precipitate the gums to bring about, in a much shorter space of time, the drying effect which the boiling itself would have. The country store-keeper is hardly to blame, as he is asked for linseed-oil, and he gives his customer the only variety he keeps, viz., boiled oil, no doubt expecting that it is wanted to mix paints. But for a certificated druggist to dispense boiled oil on a prescription which calls for *Ol. lini*, is a much more serious matter, not alone as it may affect the patient prescribed for, but the injury it may do the professional name of the prescriber. A few years ago, the writer had just such an experience. He had prescribed linseed oil with the expectation of producing a slightly laxative action. No such result followed; the animal died, and on post-mortem, enteritis was quite apparent. Shortly afterwards, another horse belonging to the same owner was given a dose of *Ol. lini* on prescription from the same druggist, and with similar results. Still a third, and again the result was the same. Naturally there was consternation, in the case of both the owner and ourselves, as we were utterly at a loss to know, or even conjecture, the cause of all the trouble. Later a fourth horse, which the owner used for saddle purposes, and which was in perfect health, but as he was to be turned out to pasture for a time, the owner thought a mild dose of linseed oil would not do the animal any harm, and again had the same prescription filled by the same druggist. In a short while after the oil had been administered, the animal began to show signs of acute abdominal pain, which aroused the owner's suspicion as to the oil. He had the prescription again filled, but this time sent it to a chemical laboratory, with the result that lead was found in abundance by several of the recognized tests for lead. Here was the whole cause of our trouble. The druggist was dispensing "bung-boiled" oil on our prescription instead of the pure raw medicinal oil; and instead of getting the action we were desirous of securing, we were stopping up the emunctories, and literally "varnishing" the digestive tract. When the truth of the matter

was brought to light by the chemical analysis of the oil, of course we were exonerated, and the druggist had to "pay the piper."

Such a case goes to show how a practitioner's reputation may be absolutely ruined, although he may be entirely innocent, through the carelessness and ignorance of a druggist who does not know that boiled linseed oil belongs to the mechanic arts, and should be kept in that department, if he has one; and has nothing in the world to do with drugs which are to be given to animals for medicinal purposes. So that, while it is good advice to the stock-owner not to purchase his turpentine or his linseed oil for his animals from a paint store, it is also well for the veterinarian to remember that even the druggist, who is presumed to keep only pure drugs for medicinal use, may, through carelessness, or the lack of sufficient knowledge of the subject, sometimes lead him into serious trouble, and possibly ruin his reputation, while entirely innocent of any wrongdoing professionally.

OUR NEW EDITOR—DR. JOHN R. MOHLER.

With the publication of this number, the editorship and business management of THE JOURNAL passes into the hands of Dr. John R. Mohler, of Washington, D. C., and the Association is to be congratulated in being able to secure the services of such an able officer.

It seems entirely superfluous to try to expatiate upon the ability and capability of Dr. Mohler for this position, as he is so well and favorably known both nationally and internationally as Chief of the Bureau of Animal Industry of the United States Department of Agriculture, and as a former President of the American Veterinary Medical Association.

We feel, in fact we know, that Dr. Mohler's vast information and broad experience as an executive, a pathologist, and as an author, to say nothing of his splendid patriotism and his high ethical concept of matters professional, ensures the future greater success of our official organ.

However, as in the case of those who have preceded him, he will need the good will, patriotism and coöperation of the entire membership to aid him in his efforts toward advancement of the profession through the medium of the Association's mouthpiece—THE JOURNAL; and these we bespeak for him in an unstinted and generous manner.

As Dr. Mohler's new duties, as Editor, will commence with the January issue of THE JOURNAL, we take this early opportunity of stating that all official communications for the publication should, hereafter, be addressed to him at 1620 Hobart Street, Washington, D. C.

W. H. D.

EDITOR'S NOTE: Owing to the change of Editor of THE JOURNAL, and the equipment having to be moved from Baton Rouge, La., to Washington, D. C., between the issuance of the December and January numbers, it is quite probable that the latter number may be a little late in getting out, as it will have to be printed and sent out from its new domicile under the direction of Dr. Jno. R. Mohler, Washington, D. C., the recently elected editor. We are not certain that any delay will be occasioned by the change; but in case it should, members and subscribers will know the reason for it, and we bespeak a little forbearance until Dr. Mohler gets the "machinery" of the publication in running order. We would also repeat, on account of the change mentioned, that all JOURNAL communications, whether from members, subscribers, or advertisers, should, hereafter, be addressed to Dr. John R. Mohler, Editor, Journal of the American Veterinary Medical Association, 1620 Hobart Street, Washington, D. C.

Prof. Russell L. Mundhenk, acting head of the Veterinary School of the Ohio State University, has resigned to accept a position with the Abbott Laboratories of Chicago.

Doctor Mundhenk is a graduate in pharmacy as well as in veterinary medicine, and has had a broad training and wide experience, particularly in biologic lines.

Serving as Captain of Infantry on the Mexican border on the outbreak of the war, he entered the United States Army as a line officer with the rank of captain. Later he was transferred to the Signal Corps, and attained the grade of lieutenant-colonel. He was awarded the Croix de Guerre by the French Government.

Dr. Mundhenk enters upon his new duties with the Abbott Laboratories with a most flattering recommendation from Dean D. S. White, of the Veterinary School of the Ohio State University.

THE ADDRESS OF THE PRESIDENT.*

VERANUS A. MOORE

This annual gathering of the members of the veterinary profession of America gives an opportunity for considering the general matters pertaining to our organization and the problems that are before it for solution. It provides for the consideration of the demands that are being made constantly upon veterinarians to increase their efficiency in accord with changing knowledge and new conditions.

In presenting this address, I desire first to thank the Association for the honor conferred upon me by election to this office, and for the loyal support that has been given me. My gratitude is due especially to our able and efficient secretary and treasurer for their most valuable assistance. I wish also to thank the members of the committees, the officers of the sections, the editor of THE JOURNAL, and the resident state secretaries. They have all been active to an unusual degree in placing the standards of the Association before the profession in their respective states. Further, we all appreciate the efforts of the local committee in arranging the many details for this meeting and for the excellent program they have provided for our social enjoyment. We are united in extending our thanks for their splendid and efficient work.

With such perfect coöperation all Association matters can be discussed and eventually settled on their merits. Further, the intricate and difficult problems that are confronting veterinarians can be brought into bold relief with the assurance that their solution will be sought for and ultimately worked out. If there are differences of opinion, honest and frank discussion will lead to mutual understanding, and in all matters of fact, judgment will be suspended until the truth is ascertained.

The past twelve months have been of great moment to our profession. In no single year, heretofore, have so many events taken place to class veterinary service in America with the learned professions. Conspicuous among these are the educational standards that have been accepted; the splendid war

* Fifty-sixth annual meeting A. V. M. A., New Orleans, La., November 17, 1919.

record; and the demands of live stock owners for efficient service. These proclaim in terms of no uncertainty that the veterinarian is coming rapidly into the "promised land" of professional honor and recognition. The shackles that limited his usefulness in the past have been replaced by intellectual freedom, integrity of service and acceptance of responsibilities that are second to none in the great battle humanity has waged, and ever must wage, against disease and the loss and sufferings it occasions.

The almost incredible advances recently recorded are the fruition of influences that have been operating for many years. A half-century ago, the seed of a veterinary profession was sown in America. It germinated in the environment of the land grant colleges that were established to develop and promote agriculture, engineering and military science "suited to the needs of the country." The veterinarians who came to those colleges defined the requirements for efficiency in combating the diseases of farm animals. The records show that their struggle to put veterinary medicine on a professional basis was a long and trying one. However, they succeeded by the same influences that changed the primitive tilling of the soil into scientific agriculture and that developed the skilled surgeon of today from the "barber" of old. Our entry into the world war did much to bring matters to a head. However, the "acid test" was not alone in the army, but quite as much in the protection of animals against disease at home. The latter became difficult, owing to the scarcity of veterinarians and to the rapid advance in the value of food producing animals. This interested the owners, who immediately called for the best that science could give to conserve their live stock. It was in this struggle against the forces of disease that the great educational victory was won. The standards of the pioneers became the minimum requirements and some of the states have demanded them for a license to practice. Thus, the advances have come about. While we rejoice in what has been accomplished, we must recognize that these successes will be followed by demands for still greater achievements. It is the difficulties in the readjustment of our profession, in these new conditions, that confront us now.

For many years I have been conscious of the existence of a false conception of professional authority. Numerous appeals have come to defend the rights of veterinarians. The profession has been ignored on a few occasions when we have felt that the

outcome would have been much better if it had been recognized. However, in the last analysis, the decision rests with those having authority. In a somewhat careful study, I do not find that practitioners are vested with it when their professional function is considered alone. In their relation to animal husbandry, it is clear that in civil, as in military life, they are aids, staff officers, and not commanders. In the true sense, veterinarians are the servants of animal owners. According to the tenets of our ethics, they can serve only when requested to do so and, by the property rights, they have no other alternative.

There is a delicacy in this situation that members sometimes overlook. The sense of being a servant is often humiliating, but never so when considered in a true, professional spirit. It is with us, as with physicians, that, as servants, we have as much right to direct and control as our knowledge and personality are able to command. The authority of veterinarians possessed with honesty of purpose, technical knowledge of their profession, wisdom in its application and sympathy with the human element, is much greater than that of a legal statute. When Iole was given in wedlock to the God of Strength, she was asked how she knew Hercules was a Deity. She replied: "When I am in his presence, I am perfectly satisfied." When veterinarians, possessed with the attributes of their profession, appear before animal owners, no question of authority will arise. Our National Bureau of Animal Industry is the result of the personal influence of a single man. Our state veterinary colleges and live stock sanitary boards came into being through a like power. I am bold enough in the faith I have in the future possibilities and usefulness of veterinarians, to believe that the time will come soon when they will command sufficiently the confidence of men in other occupations to enable them to perform fully the mission of their calling. It is this principle, rather than vested authority, that gives them the dignity of professional men.

In the application of the sciences involved in the protection of animals against disease and in calling into existence state and national live stock protection, there have developed several distinct branches of veterinary service, namely: teachers and research workers, practitioners, state live stock sanitarians, federal inspectors and army veterinarians. By this differentiation, the profession has come into actual contact with sanitary and health problems in connection with our animal industry. Although



DR. VERANUS ALVA MOORE
President American Veterinary Medical Association 1918-19.

these branches differ somewhat in function, they form integral parts of the great composite of veterinary medicine. There is a danger in the tendency to differentiate too sharply and to overlook the common rights and relationship that exist among them all.

Here, as in human medicine, the practitioners constitute numerically the great majority of the profession, while the others are specialists. Nevertheless, the practitioner is the essential teacher of the stockmen in all matters pertaining to the health of their animals and the prevention of disease. He is called often to act as a sanitarian, a meat inspector, a quarantine officer and, until recently, as temporary employee in the army. It is essential, therefore, that he be not embarrassed by the enforcement of official regulations, but encouraged to become a factor in all movements to enhance the conservation of animals. The acme of success will come when the owners coöperate fully in these efforts, and not before. The practitioners are the men among us who can establish the necessary points of contact between them and the sanitary authorities by which progress can be made. One of the difficult problems confronting us is to promote teamwork, to maintain a proper perspective of the functions of each branch of the profession throughout the range of its activities, and retain the appreciation of the common background of purpose which unites them into one harmonious whole. We are each zealous in our prerogative but we should be willing and anxious to coöperate for the common good.

The Association is to be congratulated on the present educational status. Practically all the veterinary colleges now require, for entrance, graduation from a four-year high school, or its academic equivalent. The great factor in bringing this about was the demand of live stock owners themselves for better service. We are surprised at the specifications in the requests for veterinary assistants. The teaching of scientific principles in the care of live stock, that has been going on in our agricultural schools for a half century, is finding expression in the intelligent efforts of farmers to protect their animals. The high values of dairy and meat food products and the decrease in the number of animals in proportion to our population, renders the safeguarding of live stock a matter of first importance in the production of human food and clothing.

Since our last meeting, the great war has come to an end. At the time the armistice was signed, less than fourteen months after the issuing of General Orders 130, authorizing the Veterinary Corps, there were about 2100 veterinary officers assigned to duty in the army, 200 ready for assignment and more than 600 graduates in training for commissions. There was also an enlisted personnel of about 20,000 men. Fully twenty per cent of our eligible veterinarians were in uniform. When hostilities were declared there were 62 officers and no enlisted men in the Veterinary Corps. In order that the achievements of the corps may be understood, the program contains a paper on its work in America and one on the overseas service, which will set forth the facts relative to our activities both at home and abroad.

In organizing quickly a corps composed of old and young men, all unfamiliar with the rigid discipline of army life, not accustomed to having their work inspected frequently or living in accord with the accuracy of details called for in the army, there naturally were some mistakes, errors of judgment, perhaps individual injustices and unfortunate assignments. But was there a Corps in our great National Army in which similar mistakes were not made? Is it strange that some individuals were not satisfied and that others failed? It is a splendid tribute to the profession that, in such trying circumstances, the work was done so well that commanding officers frequently have praised the efficient service of veterinarians in their commands. The recent assignment of Lt. Col. John H. Gould as a student to the general staff college at the War College in Washington is unquestioned evidence of official recognition of the veterinary service by the War Department.

It was fortunate that the Veterinary Corps was placed in the Medical Department. Some have felt that its Director should have been a veterinarian. The Surgeon General realized this more than any other, but the Director had to be familiar with military matters. The few experienced veterinarians in the regular army were needed at other posts where a civilian or medical officer could not function. The Surgeon General, who was responsible for the work, chose, as Director, an officer from his department. To supply him with the necessary veterinary knowledge, he appointed one of our most experienced members as assistant director. Thus, the corps had skilled and experienced leaders in both its administration and professional work. What more or better could have been done?

The members of this Association, and the profession generally, should understand the difficulties in organizing this service. The veterinary officers, like all others, had to be trained in the methods of the War Department so they would do the right thing in the right way and at the proper time. This required a different discipline than most civilians had experienced. When all the circumstances are taken into account, I believe the verdict of a veterinary officer, who wrote me in reference to the service, after returning from France, should be accepted: "Personally I feel that a great deal of good has been done and it is time for everybody to stay behind and push." The gratitude of American veterinarians is due the Surgeon General and the Director of the Corps for their appreciation of our service and the vigorous support they have given and still are giving it.

Among the efforts of the profession in civil life, that of "eradicating the tick" from the South and the establishment of the "accredited herd plan" for the control of bovine tuberculosis are deserving of special mention. Much credit is due the Bureau of Animal Industry for initiating and prosecuting these tasks in coöperation with the states. Nowhere, in live stock sanitary work, has the world witnessed a more important or far-reaching undertaking than the tick eradication. This Association is appreciative of Dr. Cooper Curtice for the vision that the elimination of the tick was the logical method to control Texas fever. In the not distant future, there will be an official proclamation that the blue tick is no longer in the South and that millions of acres of excellent land have been reclaimed for successful animal husbandry. The country has not yet realized the magnitude of this enormously important work. Large parts of the redeemed territory will be filled soon with the finest dairy and meat producing animals in the world. When that time comes, and it is near, the South will become a large live stock producer and require many skilled practitioners and sanitarians.

The "accredited herd plan" is doing for bovine tuberculosis in the country at large what the tick eradication is doing for Texas fever in the South. The plan calls for the assistance of all veterinarians and I appeal to them for coöperation. The method itself may require modification to enable local veterinarians to take a larger part in its operation. It is liable occasionally to give disappointment and receive criticisms from those affected. The arrested cases in herds where tuberculosis has been of long

standing, may now and then remain dormant during the period of testing and later become active and respond. It is important to recognize this element in the biology of tuberculosis and, if such cases appear, to understand what they mean and not allow them to create prejudice against the plan. It is sincerely hoped that this logical and most promising of all methods to eradicate the disease will receive undivided support.

There has been so much progress to encourage veterinarians, that one could speak at great length in praise and felicitation. However, we cannot enjoy the privileges that add genuine pleasure to the tedious routine of professional work, without accepting the responsibilities which accompany them. It seems fitting, therefore, that we should point out some of the problems that are before the profession and for which it will be held responsible not only by the live stock interests but also by the state and society generally. The veterinary profession has an important and distinct function among the human activities that go to make up the composite of our economic and social government. In the past, we have been occupied with technical details, but in these days of readjustment, we must ascertain the veterinary needs of the great animal husbandry of the land and dedicate ourselves to the task of meeting them.

The subject that gives us most concern at this time is the adequate education of veterinarians. I do not refer here to entrance requirements, length of course, sequence of subjects or methods of teaching, for these essential details are under consideration by the proper sections and committees. I am thinking of the means by which men will be able to qualify properly for the profession. Veterinary education is recognized as a state function, or as the privilege of endowed institutions. It is probable that in the near future more of the larger states will provide veterinary schools. The building and properly maintaining of a veterinary college is expensive. Too many schools would be a waste economically and unsatisfactory educationally. There should be a sufficient number of strong, adequately equipped and manned veterinary colleges to train properly as many veterinary students as the live stock interests of the country require. It is suggested that the smaller states, where the animal industry is not extensive and where but a few new veterinarians are required annually, could establish scholarships for the necessary number of students and allow them to attend any school acceptable to the authorities.

It is clearly our duty, as members of this Association, to aid live stock owners and associations and state legislatures to understand their veterinary needs and to ascertain whether a state school, state scholarships or endowment will provide more economically and efficiently for their wants. If one reflects on the many strong, well equipped veterinary colleges in Continental Europe, in proportion to the number of animals, it requires but little prophetic vision to picture the possible demands in this country, within the next fifty years. The part taken by animals in human economy will necessitate the same conservation of their health here that Europe found to be necessary.

Among the essentials in veterinary education are better opportunities for graduate work in the fundamental sciences; systematic instruction in clinical medicine, surgery and therapeutics; and training in methods of work and in research. Allbutt has reminded us that research has two purposes, "one results and the other the method which is itself an education in flexibility, ingenuity, dexterity and perseverance." There should be schools with well-equipped laboratories and clinics manned with teachers and research workers who, as another has said, "should be continually irrigating the profession from the springs of pure science." The great need of more knowledge, the differentiation of faculties, and the necessity for the scientific spirit in our profession call for more and better research and teaching in our schools. With our wealth of animals, America should lead the world in elucidating the problems connected with the diseases of dumb creation and our practitioners should be the most successful.

A matter of much significance is the selection of young men, adapted by education and temperament, to take up veterinary work. Many of our students are influenced either directly or indirectly by some veterinarian. Those who answer the call have certain traits in common. But here, as in other professions, it is the raw material, as well as the preparation, that makes for success. The work is scientific in character, technical in nature and carries a sense of public duty. The reward is that which comes with a nominal fee, or a modest salary and the consciousness of rendering service. Like human medicine, it is not an occupation for gain but one dealing essentially with biological laws, working in the animal body. Unless one can be happy in acquiring and applying this knowledge, he should not be en-

couraged to enter the profession. If our schools are to be filled with students that will do honor to themselves and in after years meet the obligations of their profession, we must all do our part in selecting them.

From the beginning of human history, people have tended to treat their own diseases and those of their animals. Notwithstanding the development of the medical sciences, the practice has continued and often it has been encouraged, by those who have placed remedies and prophylactics on the market for the use of those who cannot make a diagnosis. The discovery of the action of foreign proteins, and the immunizing value of antitoxins and certain serums have given biologic products a high speculative value which enables them to be exploited advantageously. The recorded experience in their use is favorable with some and unfavorable with others. There is a large number of so-called remedies and preventive agents that are used extensively because they are easy to administer and their labels often excuse the veterinarian and raise the owner's hopes. In this way, practitioners often are unconscious dupes of the exploiters.

The general subject has caused many inquiries and numerous criticisms from both animal owners and practitioners. In seeking a remedy for this unfortunate situation, in keeping with the knowledge of the hour and the dignity of the profession, it seems fitting to suggest that this Association consider the advisability of establishing a permanent committee, with workable funds, to investigate unofficial preparations placed on the market for treating or preventing diseases of animals and report their findings in our official journal. Such a committee would protect the manufacturers of valuable products and give a better standing to veterinary therapeutics. A few pages in our journal giving the findings of such a committee would be of great help to practitioners and of much benefit to stockmen who are becoming sorely perplexed because of the unstable knowledge of these commodities.

There is a good precedent for suggesting such a committee. In order to protect the public against the sham of patent medicines and the besetting evils of unofficial preparations, the American Medical Association established a "Council of Pharmacy and Chemistry" which undertook a systematic analysis and test of such preparations. The facts as determined by the council were, and still are, published in their journal. As many

of you know, this has proven to be of incalculable aid to physicians and a great saving to the people. In a similar manner, the agricultural experiment stations have dealt with "stock feeds" and commercial fertilizers.

There is a greater demand on veterinarians than ever before from both live stock owners and the consumers of dairy and meat food products to reduce the enormous losses from animal diseases. The economic significance of these maladies has extended beyond individual losses and affected our great animal industry, which naturally looks to veterinarians for relief. Laymen do not understand the difficulties in acquiring the knowledge necessary to prevent or treat successfully many animal plagues and consequently they become impatient in waiting for more efficient methods. Research and experimental work on these diseases are expensive both in time and money. The institutions engaged in this work are not numerous and they are uniformly limited in funds so that the volume of research is restricted. To hasten the time when the required knowledge of the important affections of abortion and sterility in cattle can be had, it would seem that a correlation of projects could be arranged whereby the desired facts could be ascertained more quickly than by present procedures. Further, a guiding committee might enlist the cooperation of practitioners and breeders in applying the recommendations that come from such researches on a scale large enough to determine their real value before they are given to the profession. I am making the above suggestion in connection with the maladies that at this time are causing the heaviest losses, as a possible means of hastening the formulation of workable methods for their prevention. Our task is the protection against disease of live stock representing billions of dollars in value and which is paying an annual toll of hundreds of millions of dollars in losses due to preventable diseases. Our united resources are far too small to insure immediate relief. We have been accessories to the neglect of research so that now when the pressing demand for higher efficiency is upon us, we are not prepared. It is to overcome as far as possible this deficiency that the suggestion is made to federate, as it were, our fragments of knowledge and research to the end that the wanton loss from disease may be checked.

In addition to our limited information on many diseases, there is a lack of facility for the general utilization of the avail-

able knowledge. I have emphasized the importance of research but equally significant is the training of the profession to apply that which is already known. In this respect, research should have a co-partner in skilled and willing hands to apply new truths. It is the necessity of knitting together research and practice that leads me to conclude that, for the best results, it should be made largely by those who also have the responsibility of instruction. It brings the worker and the student together and teaches the latter how better to observe and interpret the phenomena of disease. The field of practice is the greatest research laboratory of the profession. It should be permeated with the scientific spirit which is nothing mysterious or remote. It is every day hard sense. Unfortunately that does not make it common, but it does make it attainable.

There are numerous opportunities to extend the usefulness of our Association if its members will take a larger part both in local and national welfare work. Our members are eminently qualified for places on boards of health, for service in the American Public Health Association as well as in live stock sanitary organizations. The public is not acquainted with the value of veterinary service, or the difficult problems it has to solve in which every individual has an actual interest. We should avail ourselves of all opportunities to instruct the public in the work of the profession and to establish points of contact between it and society generally. People should know what veterinarians can do, and are doing, to protect human life against the diseases of animals communicable to man, as well as in saving property. Again, veterinarians should be more active in molding public opinion on all matters relating to the diseases of animals and in directing wise legislation and regulations to safeguard the health of live stock. There are many men who are doing noble work in this direction but its importance to the country renders it necessary that we all participate.

In 1916, there was established, under the Congressional Charter of the National Academy of Sciences a National Research Council with the coöperation of the national scientific and technical societies of the United States. Our Association is not represented in this council. I have had considerable correspondence with the officers and find they are very sympathetic with the suggestion for a veterinary representative. The matter will be taken up by the Division of Medical Sciences at its next

meeting, which is the last of this month. A technical difficulty at present is that the council has contracted for all of its available funds. Because of the great importance to the nation of veterinary service, I would recommend that this Association appoint a committee consisting of the President and Secretary to continue the negotiations and to select a representative for the council in case one is granted. The term of office is three years. I would recommend further, in order not to delay our participation in the work, that the Association pay the expenses of its member to attend the meetings until such time as the budget of the council can provide for our representative. As a rule, these meetings do not occur oftener than once in six months. It seems very desirable for us to have an active worker in the National Council. I regret that further progress cannot be reported at this time.

I am constrained to call attention to a matter pertaining to the work of the Association that is before us for action. We are living in new times. The public expects more of us, collectively and individually, than ever before. This emphasizes the importance of a wise decision on the resolution to combine in one office the editorship of *THE JOURNAL* and the secretaryship. It is largely through these officers that the standards of the Association are placed before the profession and the public. The secretary has occasion to meet personally, or by letter, a large number of veterinarians, live stock men and others in connection with professional and Association matters. He has to deal with those friendly disposed and those who are hypercritical of our shortcomings. His unenviable yet important task is to leave always the right impression regarding the character and purpose of veterinary service. Likewise, the editor becomes our spokesman, through the printed page. He determines largely the character of our following, our standing among the educational and scientific associations of the country and our peers in other lands. We decided, and I believe wisely, to have an official journal. It is our duty to see that the excellence of its subject matter and the ethical purity of its advertisements be maintained and advanced as future progress demands. Can all the duties that now fall upon the secretary and editor be performed more efficiently by one man giving it his full time or by two men, each on part time? This is the question to be decided.

There are many topics such as the advisability of continuing certain committees; the elimination or minimizing of the expense

of the local committee; a working program for resident state secretaries; and many others that could be discussed if time permitted but they must be left to the good judgment of the Association.

Finally, my feeling regarding the veterinary profession in the time to come is expressed in a statement relative to the future of America made by Huxley, in 1876, at the opening of Johns Hopkins University. "Truly," she "has a great future before her; great in toil, in care and in responsibility; great in true glory if she be guided in wisdom and righteousness; great in shame if she fail."

THE DIFFERENTIAL FEATURES BETWEEN MELANOSIS AND MELANOSARCOMA.*

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College, at Cornell University, Ithaca, N. Y.

(Continued from page 153.)

PART TWO: CASES.

Case 1. A grey gelding that died of acute serofibrinous pleuritis. Autopsy 446. There were three black nodules, each about 2 cm. in diameter, in the intermuscular connective tissue in the region of the right shoulder. On section these were uniformly jet black, dense, and the cut surface smooth and shiny. These were the only melanotic lesions found. They did not show on the living animal and apparently produced no discomfort.

Microscopically these nodules were composed of brownish black masses held in a dense connective tissue network containing numerous blood vessels. There were irregular shaped spots of pigment in this connective tissue as well as in the surrounding muscle fibers. In bleached sections, the areas formerly occupied by melanin were composed of large spindle shaped cells containing large oval nuclei. Numerous processes emanated from some of these cells. The cytoplasm of these cells was finely granular. Mixed in with these cells there were relatively few large oval or rounded cells with a finely granular cytoplasm. Some of these contained small round nuclei while others were free from nuclei. These cells closely resembled epithelioid cells.

* Presented before the twenty-ninth annual meeting of the New York State Veterinary Medical Society, July 24, 1919.

Near the edge of the nodules the spindle shaped cells were arranged in rows between the muscle fibers.

This is apparently a primary melano-sarcoma. It is one of a large number of cases of grey horses in which somewhere in the body there are found melanotic tumors, that have not been detected during the life of the individual. These are usually found in the region of the shoulder or the anus. They originate in the skin and infiltrate the neighboring muscles or the neighborhood lymphatics. Ewing points out that the reason for the pigmented nevi taking on malignant characters is the irritation produced by the patient, by surgeons, or by other specialists. It is possible that the reason for their occurring in the shoulder or at the base of the tail in grey horses is because of irritation in these areas produced possibly by the harness of these animals.

Case 2. Accession number 253. A grey mare that was very stiff and sore when brought to clinic. She was in poor condition. There was a watery discharge from the left teat. There was a large tumor in the mammary gland. There was one also at the internal inguinal ring weighing $2\frac{3}{4}$ pounds.

The left mammary gland was greatly enlarged, 25.5 cm. x 17 cm. x 12 cm. Weight, 7 lbs. On section, it contained a large lobulated black mass 15 cm. long and 11 cm. in diameter. In the center there was a cyst 6 cm. in diameter containing liquid. The solid area contained strands of whitish connective tissue running in every direction. There was another lobulated nodule 10 x 4 x $4\frac{1}{2}$ cm. dorsal to the main one and one 10 x 8 x 5 cm. a little above the teat. The center of this mass was necrotic. There were smaller black nodules varying from .5 to 3 cm. in diameter around the main mass. The glandular tissue was almost entirely replaced by the black masses. (Fig. 1.)

All of the lymph glands were enlarged and melanotic. One of the lymph glands was preserved. This was greatly enlarged and lobulated. It measured 14 cm. long and 10 cm. in diameter. On section the lymphatic structures were apparently gone. In its place was one main nodule and several smaller ones. The main nodule was spherical and somewhat nodular. It measured 9 cm. in diameter. Each of the smaller ones was about 3 cm. in diameter. These nodules were brownish black and streaked with bands of whitish connective tissue running in all directions.

The left lung contained two blackish tumors, 3.75 and 8.75

PLATE I

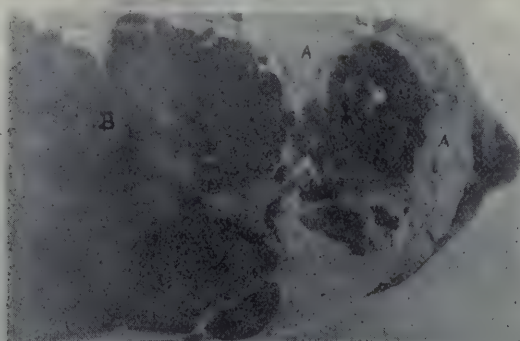


Fig. 1.

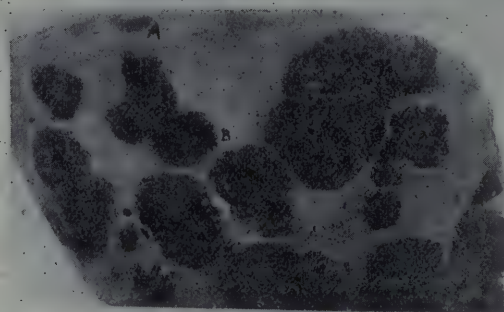


Fig. 2.

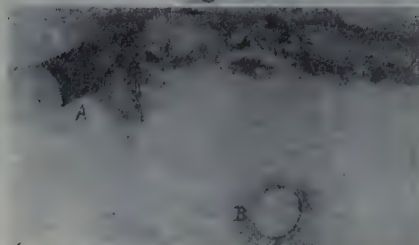


Fig. 3.

cm. in diameter. These were spheroidal with depressed centers, containing some whitish, translucent material. The right lung contained a small tumor 1.25 cm. in diameter on the external surface of the apical lobe.

The spleen weighed 4.5 lbs. It contained eleven black spheroidal tumors 4.8 cm. in diameter, projecting 1-3 cm. from the surface.

In the skin there was an irregularly lobulated nodule 6x6x4 cm.

The liver was greatly enlarged, firm in consistency, and roughened by numerous black nodules varying in size from 3 mm. to 5 cm. in diameter, projecting on the surface. These nodules were uniformly distributed over the surface of the liver. On section these nodules were distributed throughout the liver tissue (Fig. 2). The weight of the liver with the omentum and part of the diaphragm was 53.5 lbs.

There was a lobulated black mass 5x3½x2½ cm. nearly completely encircling one of the larger abdominal arteries. The pancreas contained a melanotic mass. Two ribs were fractured and contained melanotic deposits.

In one area near the cartilage of prolongation, the bony tissue of the scapula was blackened throughout its width and thickness. The periostium in this place was also black. Adjacent to this area there was an irregularly shaped black nodule 2.5 cm. in diameter in the attached muscle. In other parts of the skeletal muscles there were comparatively few nodules 5-8 mm. in diameter.

The diaphragm, omentum, peritoneum and pleura were sprinkled with black tumors, from a mere point in size to irregular deposits 8-10 cm. long.

Each kidney contained a few rounded black nodules .5 mm. to 1 cm. in diameter. These were distributed in the cortex and the pelvis, a few projecting from the surface.

In the heart, the myocardium contained numerous nodules varying in size from 1 mm. to 1.5 cm. Most of these were under the endocardium projecting into the heart. All the chambers of the heart were about equally affected. There were only relatively few nodules under the epicardium projecting outwardly. There were two nodules on the surface of the aortic arch. With the exception of a nodule at the base of one of the mitral valves, the valves were not affected. (Fig. 4). The heart weighed 10 lbs.

The adrenals contained numerous black nodules varying in size from .5 mm. to 1.5 cm. in diameter. These were uniformly distributed throughout the cortex and the medulla.

Microscopically, in the mammary gland, the tumor was composed of round cells with round nuclei as well as large spindle shaped cells with large oval nuclei, with a dense richly vascular

PLATE II

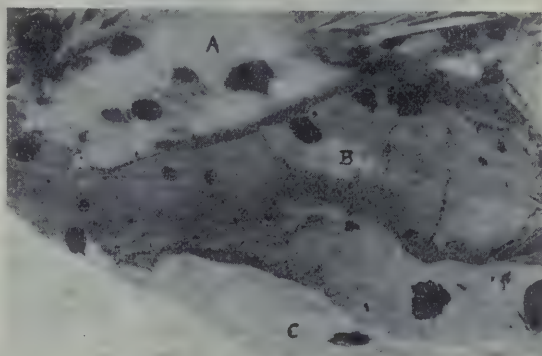


Fig. 4.

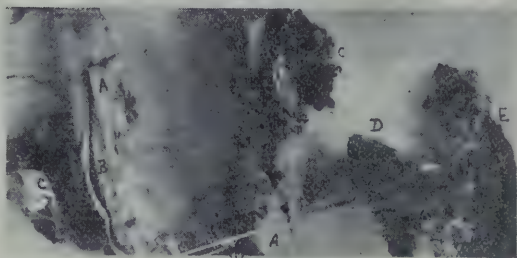


Fig. 5.

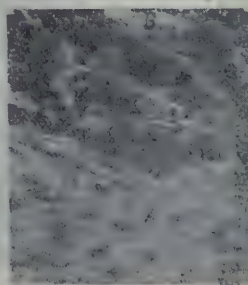
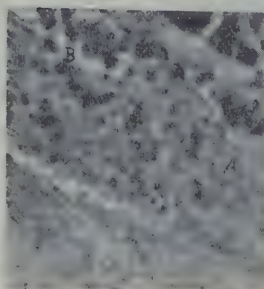


Fig. 6. Fig. 7.

connective tissue stroma. There were a few giant cells with a central arrangement of the nuclei. Some of the round cells were arranged around the blood vessels. In places the round cells and the spindle shaped cells have infiltrated the connective tissue stroma. The pigment was in the form of brown granules scattered in the cytoplasm of the cells, in some places completely filling the cytoplasm. In some of the cells the nucleus also was covered by the pigment. The round cells were more richly pig-

mented than the spindle shaped cells. There was also an infiltration of pigment in the surrounding connective tissue stroma, in places. The few giant cells were free from pigment. There was some evidence of cell division by mitosis.

In the lung there was a distinct perivascular arrangement of the tumor cells, otherwise it showed the same general features as the mammary tumor. In one place there were seen large round cells with coarsely granular chromatin material scattered through the cytoplasm. These were apparently vascular endothelial cells. No giant cells were seen in this preparation.

In the liver the general features of the tumor were the same as in the lung. The bluish granules in the cytoplasm were more abundant and more striking than in the other organs. These were scattered throughout the section in sharp contrast to the brownish melanin granules. They were more prominent where the brown granules were scanty. At the periphery of the nodule the cells showed an infiltrating growth. There was also marked proliferation of the bile ducts at the periphery of the nodule.

The renal and adrenal tumors showed the same features as those of the liver. (Fig. 7).

This is evidently a melanosarcoma primary in the mammary gland. It is an extremely interesting case from a pedagogical point of view. It is that of a melanosarcoma that had undergone metastasis by both the blood and lymph streams and affected nearly every organ in the body. In the various organs it shows how the tumor cells multiplied and produced growths. Later, another crop of cells were deposited. These in turn also multiplied at the points of deposit and produced nodules. In this case, there were about four or five crops, and the last ones were apparently scattered broadcast.

The number of these nodules do not indicate the number of cells distributed. It is very well known that the tissues in the body fight these cells just as they do parasites. These so-called resisting forces of the body destroy many of the invading cells. It is perhaps a comparatively small number of the cells lodged in the tissues that survive, multiply and produce nodules. Even then the resisting powers do not rest. These nodules are surrounded by a connective tissue wall to keep them from spreading. In the case of malignant tumors, the tumor cells infiltrate the connective tissue so that this wall is broken down.

The determination of the organ in which the tumor originates is comparatively easy in the epithelial tumors, from the nature of the cells. In the case of the connective tissue tumors, it is very difficult because every organ in the body has a supporting connective tissue structure. Other means of determining the origin of a tumor is by the size of the tumor, and whether secondary changes have taken place. These would indicate the age of the tumor, and of course the organ in which the tumor is oldest, is the point of origin. In this case the tumor in the left mammary gland is the largest and it contains a large cyst, so that we consider this as being the mother tumor. From this point it spread to the lymph glands, then to the lung and spleen, then to the liver and peritoneum, then to the other organs. This is determined by the largest tumors found in the respective organs. These conclusions are not always correct, for the reason that some of the tissues may offer a better medium for the multiplication of these cells. In other words, some tissues may be more resistant than others. It is very well known that in some cases the primary tumor may become arrested and resume a dormant state. This would make the primary tumor smaller though older than the others, and secondary changes also may not take place in the primary growth.

Case 3. A 20 year old grey percheron gelding weighing 1200 lbs. The history was that some time back the animal slipped and went lame. There was evidence of gradual recovery when, three weeks previous to death, the animal fell into a coal chute. A week later there was another accident. There was then noticed progressive posterior paralysis, particularly of the right hind leg. There was atrophy of the right gluteal region. The animal was destroyed. Autopsy immediately after.

There were three subcutaneous melanotic tumors. One 9 cm. long and 5 cm. in diameter near the cartilage of prolongation of the scapula. Another 3 cm. long and 2.5 cm. in diameter in the supra-anal region. The third one was smaller, and situated on the linea alba anterior to the prepuce.

The spleen weighed 4.4 kg. It contained large round tumors varying in size from 3 cm. in diameter to 15x10x12 cm. On section, these tumors were of a greyish black color, and the centers of the larger ones were cystic containing a blackish liquid. The nodules were uniformly distributed throughout the organ.

The sublumbar lymph glands were in the form of two large black tumors 21x17x15 cm. and 15x10x9 cm. These were firmly adherent to the adjacent vertebræ and contained some calcified areas. The two glands weighed 4 kg. The adjacent lumbar vertebræ were of a black color. At the point of origin of the lumbo-sacral plexus there was a melanotic tumor 5 cm. long, 3.5 cm. at its widest point, and 2 cm. thick. Four cm. behind this one there was a tumor 3.7x3x2 cm. These tumors were in the spinal canal. They involved the spinal meninges and surrounded the spinal nerves. The larger one also infiltrated the body of the vertebra at that point. In the lumbar region 10 cm. above the largest tumor there was, in the spinal canal, a black mass 4x2.5x2 cm. grown into the spinal meninges. (Fig. 5). All these tumors were sufficiently large to produce pressure upon the cord and the sacro-lumbar roots which they involved. There were several pigmented areas 1-3 cm. in diameter beneath the sublumbar peritoneum.

The pancreas contained a black nodule 2 cm. in diameter. The left adrenal contained two melanotic nodules each about 1.5 cm. in diameter.

In the latissimus dorsi muscle there were several black nodules varying from 1 mm. to 1 cm. in diameter. The right popliteal lymph glands were in a black mass 12x8x6 cm. not infiltrating the surrounding muscles.

Microscopically, in the adrenal the black tumors were made up of large spindle shaped, oval, and here and there smaller round cells. The nuclei in these cells occupied from one third to two thirds of the cell, and the nucleoli were very prominent in the oval and in the spindle shaped cells. Nuclear division by mitosis as well as by amitosis was seen. These cells were arranged in large nests and surrounded by a rather scant vascular connective tissue stroma. The nests were also richly supplied with blood vessels. Under the low power the tumor in the adrenal closely resembled that of a glandular carcinoma. At the periphery the tumor cells invaded the surrounding structures. The pigment was in the form of fine brown granules in the cytoplasm of the cells. In some of the cells the pigment was in masses covering the entire cell including the nucleus. (Fig. 6). In the surrounding adrenal cells there were coarse chromatin

granules in the cytoplasm. There was marked congestion in the adrenal tissue.

In the bone the tumor cells invaded the marrow spaces. In the section studied, these cells did not invade the dense bony tissue or the articular cartilage.

In this instance the nodules in the spleen showed central necrosis while the subcutaneous lesions were quite small. It is quite possible, however, that the primary lesions were in the perineal region with secondary involvement of the sublumbar and popliteal lymph glands and later the other organs. It is possible that the shoulder lesion was also primary, since it is remote from the other chain of tumors, and there were no nodules in the thoracic cavity.

This is evidently a melanosarcoma originating in the perineal region.

Case 4. Viscera of a fowl. Accession number 460.

There was an irregular black mass 8x6x4 cm. attached to the mesentery. The rest of the mesentery was sprinkled with black growths varying in size from .5 mm. to spherical nodules 3 cm. in diameter. Some of these were soft, others were firm in consistency. There were numerous similar growths on the serous surfaces of the intestines, proventriculus, and gizzard, some of them infiltrating, others only surrounding the muscle coats of these organs. There were growths also on the serous surface of the liver. The ovaries were sprinkled with black nodules varying in size from .5 mm. to 2 cm. in diameter. The other organs were not available so that it is impossible to determine with certainty the origin of this tumor, or the color of the individual.

Microscopically, these tumors were composed of irregularly shaped large cells with round nuclei occupying about one third of the cell. These cells were arranged around various sized blood vessels and blood spaces, with a scanty connective tissue stroma. Minus the pigment, it resembled a cavernous angiosarcoma. (Figs. 9 and 10). The cells resembled epithelioid cells, some of them appearing like columnar epithelial cells. The pigment was arranged in the cytoplasm in the form of fine and coarse granules and in masses covering up the nucleus.

This is a case of perivascular melanosarcoma. In this case the largest tumor was in the mesentery. It is possible that this was the mother tumor, with metastases in other parts of the

PLATE III

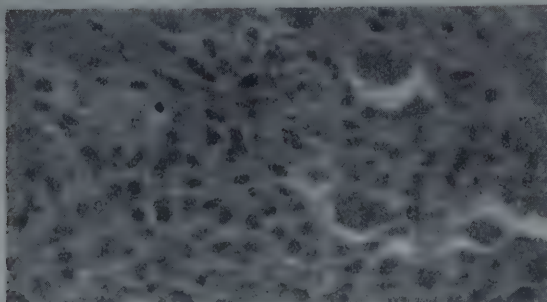


Fig. 8.

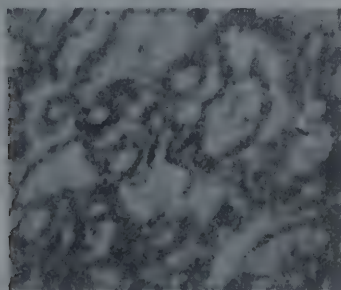


Fig. 9.

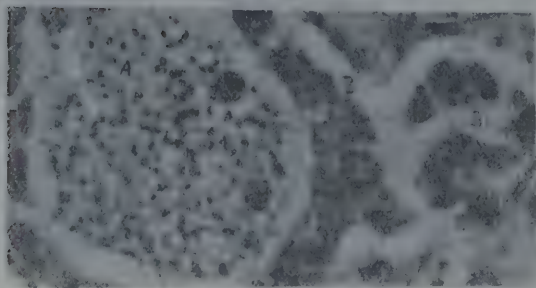


Fig. 10.

peritoneum and in the ovary. The determination of the point of origin is, however, impossible without the other organs. The tumor itself is extremely interesting, since it is composed of cells resembling epithelioid cells in a peculiar perivascular arrangement. In places these cells form the entire wall of the vessels or blood spaces as the case may be. In the literature I was unable to find a case of melanosis in a fowl or a melanosis

presenting this histological picture, in any of our domestic animals.

Case 5. An about one year old male turkey (*Meleagris domestica*) weighing 12 lbs. The purchaser returned the carcass on account of black discoloration of the viscera. The butcher did not notice anything wrong while dressing the carcass. The dressed carcass minus the head, feet, and the viscera that is generally removed while dressing, was received for diagnosis. The carcass was in excellent condition.

The costal pleura was of a black color. This was most marked anteriorly and gradually diminished toward the distal end of the thoracic cavity where it appeared of a bluish black color. The lungs were black, the pigment appearing in an arborous form under the pleura. The cephalic end of the lungs was more markedly pigmented than the distal end. On section, there were spots of pigment uniformly scattered throughout the lung tissue. The aorta, the larger arteries, as well as the spinal meninges, were covered with black material. The kidneys and testes contained scattered black spots. The other organs were apparently free from this pigment.

Microscopically in the kidney, the pigment was in the form of fine and coarse granules around the blood vessels, principally around the medium sized arteries.

In the testes, the pigment was found to be in the interstitial tissue around the seminiferous tubules, and in spots in the tunica albuginea. (Fig. 11).

In the lung the pigment was situated in the interlobular connective tissue, mostly around blood vessels. A little of the pigment was in the alveolar walls next to the interlobular tissue. There were also masses of pigment in the subpleural connective tissue in places.

In the large vessels the location of the pigment was in the tunica adventitia particularly around the fat cells, the vasovasa, and around the nerves and between the nerve fibres. (Fig. 12). In bleached preparations, it was found that this pigment was situated in spindle shaped branched cells. (Fig. 14). These cells were very much smaller than those found in the cases of melano-sarcoma. The pigmented areas in this case are not in the form of nodular swellings, the organs affected are, aside from the pigmentation, normal in every respect. In addi-

PLATE IV

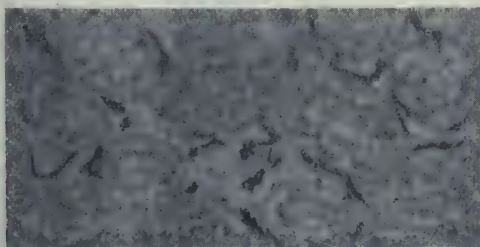


Fig. 11.

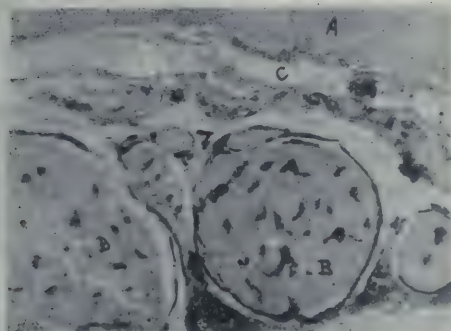


Fig. 12.

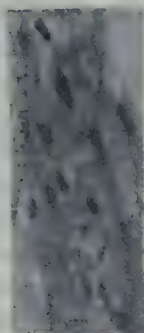


Fig. 13.

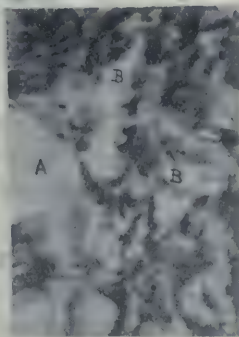


Fig. 14.

tion, the body generally is in good condition without any evidence of cachexia or intoxication which is so common in malignant tumors. The diagnosis in this case must be melanosis.

Case 6. A spinal cord of a calf that was sent in for diagnosis.

The meninges were black throughout. On section the pia was black throughout extending into the ventromedial fissure. The arachnoid also contained pigment throughout. The inner surface of the dura was slightly pigmented. Externally this

gave the cord a bluish color. The cord itself appeared normal. (Fig. 3).

Microscopically, the pigment was found, as in the previous case, in small spindle shaped branched cells situated mostly around fine blood vessels. The cord proper as well as the lining of the central canal, were free from pigment.

This is also a case of melanosis. In this case also the organ that contained the pigment was otherwise in a healthy condition, and the carcass was fit for food. The pigment, while affecting practically all the meninges did not produce a visible thickening. It was not in the form of a nodular growth. The conclusion must therefore be that it is melanosis and not melano-sarcoma. Such melanosis occurs quite frequently in calves. Usually it is in the form of black spots in the subcutaneous, subperitoneal, subpleural, and intermuscular connective tissue. This condition is known as *melanosis maculosa*. It is brought about by oval or spindle-shaped specialized cells known as chromophores. (Fig. 13). This pigment seems to disappear in later life, so that it is very rare in adult cattle.

In the latter, melanosarcoma occurs while young calves are apparently free from it. In the human subject also, melano-sarcoma does not make its appearance until about 25-30 years of age. This fact shows the possibility that melanosarcoma may sometimes result from melanosis.

In the course of the routine autopsies performed, we have encountered melanosis in adult horses that is worthy of mention. These were in the form of irregular oblong black areas 1-3 cm. long and .5-1 cm. wide, located in the subserous connective tissue of the ileum. They were observed in black, brown and sorrell mares and geldings. Microscopically, the pigment was situated in oval shaped cells in the form of fine brownish black granules.

From a review of the literature, it will be seen that none of our domesticated animals is free from melanosis and melano-sarcoma. It will also be seen that it is more frequently encountered in the darker colored individuals, particularly in those horses that are born dark and later change to grey or white.

Virchow ascribed their occurrence in white horses as evidence of a constitutional weakness.

Eppinger regards the excess of pigment and its products especially indol and skatol, as the cause of the overgrowth of the cells.

Stoeber and Wacker observed that indol and skatol cause marked proliferation of epithelial cells.

Their almost constant occurrence in grey horses may be due to a family inheritance, the same as mouse carcinoma.

From the above observations, the following conclusions seem to be justified.

1. That both melanosis and melanosarcoma occur in our domestic mammals as well as in fowls.

2. That the melanin is, in both of these affectations, produced by oval spindle-shaped pigment cells (chromatophores).

3. That melanosis should be regarded only as that form of pigmentation where there is no nodular growth, metastases, or cachexia resulting from intoxication which is often found associated with malignant tumors.

4. That melanosarcoma should be regarded only as that form of pigmentation associated with nodular growth, infiltrating more or less the neighboring structures, producing metastases, or showing evidence of intoxication.

DESCRIPTION OF PLATES

PLATE I

Fig. 1. Section of left mammary gland. Case 2. One half natural size.

A. Remaining glandular structure containing an increased amount of fibrous tissue.

B. Large sarcomatous mass showing central cyst formation.

C. Necrosis in the center of a smaller melanotic mass.

Fig. 2. Section of liver. Case 2. One half natural size.

A. Nodules projecting on the surface.

B. Central melanotic nodules.

Fig. 3. Spinal cord calf. Case 6. Natural size.

A. The dura mater cut to expose the jet black arachnoid and pia.

B. Cross section of the same cord showing the arachnoid and pia mainly involved.

PLATE II

Fig. 4. Metastatic nodules heart. Case 2. One half natural size.

A. Endocardium of left ventricle.

B. Myocardium.

C. Epicardium.

Fig. 5. Melanosarcoma spinal cord, horse. Case 3. One half natural size.

A. Spinal meninges.

B. Exposed normal spinal cord.

C. Tumor nodules involving the meninges.

D. Tumor nodule surrounding a spinal nerve and involving a vertebra.

Fig. 6. Melanosarcoma adrenal horse. Case 3. x 350.

A. Cortical tissue of adrenal.

B. Large cells containing granules of melanin infiltrating the cortical tissue.

Fig. 7. Melanosarcoma adrenal horse. Case 2. x 650.

A. Cortical cells of adrenal.

B. Large tumor cells containing melanin.

PLATE III

Fig. 8. Bleached melanosarcoma of pig. (Dr. Pickens' case) x 650. Note the large spindle-shaped cells of which the tumor is composed, with here and there large rounded giant cells in spaces.

Fig. 9. Melanosarcoma mesentery fowl. Case 4. x 105. Note the alveolar structure of the tumor.

Fig. 10. Bleached section same as fig. 9. x 650.

A. Nucleated red corpuscles.

B. Large irregular shaped cells forming vessel walls.

PLATE IV

Fig. 11. Melanosis of testis turkey. Case 5. x 155. Note the arrangement of the pigment around the seminiferous tubules.

Fig. 12. Melanosis artery turkey. Case 5. x 105.

A. Tunica media.

B. Pigmentation in and around nerves of tunica adventitia.

Fig. 13. Bleached specimen of melanosis maculosis in the intermuscular connective tissue of a calf showing large spindle-shaped pigment cells. x 650.

Fig. 14. Bleached preparation of fig. 12. x 650.

A. Fat cell.

B. Spindle-shaped pigment cells.

THE USE OF CARBON BISULPHID IN INFESTATIONS WITH BOTS, *GASTROPHILUS* SPP.

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The carbon bisulphid treatment for the removal of bots from horses was proposed by Perroncito and Bosso in 1894 and has been advocated by many writers since on the clinical findings. Experimental evidence in support of the idea that it was 100 per cent effective against bots when given in adequate amounts was published by Hall (1917). He gave a horse two doses of 20 mls (about 5 drams) each of carbon bisulphid with a 2-hour interval and followed this two hours later with 800 mls of linseed oil, removing 10 bots and leaving the horse free from bots on post-mortem examination. Hall, Smead and Wolf (1919) have published additional experimental confirmation of the reliability of this drug in removing bots. They used eight horses. Of these, two horses received one dose of 6 drams of carbon bisulphid, four horses received two doses of 4 drams each with a 2-hour interval between the doses, and two horses received three doses of 3 drams each at 1-hour intervals, the latter dose being the one recommended by the U. S. Department of Agriculture. No purgation preceded, accompanied or followed the treatment, the only preparation being to fast the animals from noon of one day until treatment the following morning. The treatment removed all of the 690 bots present in six of the horses, the other two horses being free from bots. They note that one 6-dram dose was as effective as two 4-dram doses or three 3-dram doses, and suggest that further experiment might show that a single dose of less than 6 drams would be adequate. Incidentally, they found carbon bisulphid 97 per cent effective against ascarids in the horse, removing 91 of 94 ascarids present in the eight horses, and suggest that the simultaneous use of a purgative might increase its efficacy against these worms.

In order to ascertain the minimum effective dose, we have carried out some tests of carbon bisulphid on four horses at the Bureau Experiment Station at Bethesda, Maryland, using less than 6 drams to a treatment, and have also sought to determine whether the simultaneous use of a purgative would increase the efficacy of the drug against ascarids.

The horses were fasted about 24 hours and not given food or water for 4 hours after treatment. The protocols of these experiments are as follows:

Horse No. 207 was given a dose of 5 drams in a hard capsule. Examination of the manure for the following days showed bots as follows: None; 2 *G. intestinalis*, 1 *G. nasalis*; 16 *G. intestinalis*, 8 *G. nasalis*; 8 *G. intestinalis*, 3 *G. nasalis*; none; 2 *G. intestinalis*; 1 *G. intestinalis*; none; none; a total of 27 *G. intestinalis* and 12 *G. nasalis*. The horse was killed on the tenth day after treatment and found to have four live bots, all *G. nasalis*. The treatment was therefore 100 per cent effective against *G. intestinalis* and 75 per cent effective against *G. nasalis*. To extend these findings, a smaller dose was used as follows:

Horse No. 206 was given 4 drams of carbon bisulphid in a hard capsule. The next day the fecal findings were negative; the next day the manure contained 11 *G. intestinalis*; the third day, 1 *G. intestinalis*; the fourth day, 1 *G. intestinalis*; the findings for the next five days were negative; a total of 13 *G. intestinalis*. The horse was killed on the ninth day and found to have 27 live specimens of *G. nasalis* attached to the duodenum and 1 to the jejunum. The treatment was therefore 100 per cent effective against *G. intestinalis* and 0 per cent effective against *G. nasalis*.

Since single doses of 4 or 5 drams were entirely effective against *G. intestinalis*, with a marked drop of efficacy, from 75% to 0 per cent, against *G. nasalis*, in lowering the dose from 5 to 4 drams, a 5-dram dose was divided, horse No. 203 receiving 3 drams in a hard capsule, followed two hours later by 2 drams additional, the idea being that this would prolong the period of exposure to the drug, although it diminished the concentration of the gas in the stomach. Examination of the manure on succeeding days showed the following: For the first two days (a Saturday and Sunday) together, 51 *G. intestinalis*, 17 *G. nasalis*, 1 ascarid; on succeeding days, 47 *G. intestinalis*, 11 *G. nasalis*; 41 *G. intestinalis*, 4 *G. nasalis*; 10 *G. intestinalis*, 7 *G. nasalis*; 2 *G. nasalis*; 2 *G. intestinalis*, 9 *G. nasalis*, and 3 bots lost and not identified (disregarded in subsequent figures); none; a total of 151 *G. intestinalis*, 50 *G. nasalis*, and 1 ascarid. The horse was killed on the eighth day after treatment and found to have 93 live bots attached in the stomach, duodenum, jejunum and ileum, of which 79 were *G. nasalis* and 14 *G. intestinalis*. There

were also 16 dead bots in the cecum, colon and rectum, of which 11 were *G. intestinalis*, the other 5 bots being lost and not identified. These 5 bots are disregarded in computing efficacy. The treatment was therefore at least 92 per cent effective against *G. intestinalis* and 39 per cent effective against *G. nasalis*, and entirely effective against ascarids. This is a decline in efficacy against *G. intestinalis* from the single dose of 4 or 5 drams, but an increase in efficacy against *G. nasalis* over the single dose of 4 drams.

As a final test, horse No. 211 was given 5 drams of carbon bisulphid in a hard capsule and this was followed within a half hour by a pint of linseed oil. The day after treatment the horse passed 1 *G. nasalis* and the next day 1 *G. intestinalis*. No parasites were passed during the next three days and the horse was killed the fifth day after treatment. The horse had approximately 150 bots in the stomach, 225 in the duodenum and 4 in the small intestine below the duodenum, a total of between 350 and 400 bots, of which the majority were *G. nasalis*, the others being *G. intestinalis*. There were also 3 ascarids in the small intestine. The treatment was therefore practically an entire failure, removing no ascarids and only 2 bots, a negligible number in view of the infestation present. Since the only important respect in which this experiment differed from the other experiments detailed here was in the administration of linseed oil, and since the other experiments showed an efficacy of 92 to 100 per cent against *G. intestinalis*, it must be concluded that the administration of linseed oil with carbon bisulphid, or soon after, is distinctly contraindicated. We may tentatively assume that the linseed oil mechanically protects the bots from the full effect of the carbon bisulphid. As a rule, writers do not recommend the use of linseed oil with carbon bisulphid, but it has been recommended by Maedougall (1918), who gives the following procedure: Add 1 ounce of carbon bisulphid to 11 ounces of linseed oil and give 2 ounces of this mixture every 2 hours until all of it has been given, the horse being fasted for 12 hours before treatment. This is a long, tedious process and our experiments would indicate that it might give less satisfactory results than a treatment with smaller doses where the linseed oil was omitted. He also notes that in two cases where a pint of linseed oil was given after the last dose of this mixture, superpurgation was set up, 1 animal dying in three days and the other recovering after a long course of treatment. Hutyra and

Marek (1914) note a method in which the carbon bisulphid is followed by 250 to 500 grams of castor oil or by 6 to 10 grams of tartar emetic after 12 to 24 hours. After such an interval it is unlikely that the action of the drug would be interfered with by the purgative, but on the other hand there seems to be no necessity for the administration of a purgative and there is a reason why the injury due to the carbon bisulphid (we find the characteristic inflamed area the size of a hand in the cardiac stomach, as was described by Hall, Smead and Wolf, 1919) should be added to by the administration of an irritant such as tartar emetic. The procedure heretofore recommended by the U. S. Bureau of Animal Industry calls for preliminary purgation the evening before treatment with a pint of linseed oil or an ounce of Barbadoes aloes. In view of the present experimental evidence there appears to be no need for this purgation and it might as well be omitted, though there is no reason to suppose that linseed oil given at that time would interfere with the action of the carbon bisulphid. As already noted, Hall (1917) found that with two doses of 20 mls of carbon bisulphid with a 2-hour interval, followed two hours later by 800 mls of linseed oil, all bots, including *G. nasalis*, were removed.

An interesting feature of our experiments is the fact that *G. nasalis* was not removed or not entirely removed by doses that removed all of the *G. intestinalis* present. We do not regard this as due to any greater resistance to the drug on the part of *G. nasalis*, but to its location around the pylorus and in the duodenum. The characteristic lesion due to carbon bisulphid shows that it tends to remain in the cardiac stomach for some time, thus subjecting the bots there to the full force of its action. From here on the drug is subject to absorption, which decreases the amount available, to dilution with the fatty content of the intestine, which decreases its concentration, and to the comparatively rapid peristalsis of the small intestine, which decreases the time of exposure of the bots there to the lethal action of the drug. That *G. nasalis* is not essentially more resistant is evidenced by the experiments *in vitro* by Dove (1918) who found *G. intestinalis* to be the most resistant of the species of *Gastrophilus* to carbon bisulphid. It may be safely assumed in this connection that specimens of *G. haemorrhoidalis* which have passed to the large intestine, as they do in the spring, are likewise unaffected by the oral administration of carbon bisulphid by virtue of their location.

It may be noted in passing that Townsend (1918) has recently created the genus *Rhinogastrophilus* for the single-spined bot, *G. nasalis*.

SUMMARY.

The experimental evidence to date indicates that all bots present in the stomach and duodenum will be removed by the use of single doses of carbon bisulphid in amounts of 6 drams, or by two doses of 4 drams each with an interval of two hours, or by three doses of 3 drams each at 1-hour intervals, when given without purgation or with purgation at least several hours before or after treatment. The single dose gives a smaller total of the drug and saves time. Repeated doses give an opportunity to suspend treatment, if bad results are evident after the first dose. In the interest of safety, these doses should not be exceeded.

Carbon bisulphid in doses of 4 or 5 drams will remove all the *G. intestinalis*, in their usual location in the cardiac stomach, but will leave some or all of the *G. nasalis*. The minimum effective doses for bots in general are, therefore, those stated in the preceding paragraph. In the interest of efficacy, the dosage given should be employed.

The use of linseed oil within a half hour of the administration of the carbon bisulphid will greatly diminish the efficacy of the drug against bots and against ascarids. Such use should, therefore, be avoided in the interest of efficacy. It seems to add nothing to the animal's safety and under certain conditions may cause superpurgation.

BIBLIOGRAPHY.

- Dove, W. E. 1918. Some biological and control studies of *Gastrophilus haemorrhoidalis* and other bots of horses. Bull. 597, U. S. Dept. Agric., Wash., Apr. 9, 51 pp., figs. 1-4, pls. 1-5.
- Hall, Maurice C. 1917. Notes in regard to bots, *Gastrophilus* spp. J. Am. Vet. M. Assn., Ithaca, N. Y., v. 52, n. s., v. 5 (2), Nov., pp. 177-184.
- Hall, Maurice C.; Smead, Morgan J.; and Wolf, Charles F. 1919. Studies on anthelmintics. 2. The anthelmintic and insecticidal value of carbon bisulphide against gastrointestinal parasites of the horse. J. Am. Vet. M. Assn., Baton Rouge, La., v. 55, n. s., v. 8 (5), Aug., pp. 543-549.

- Hutyra, Franz; and Marek, Josef. 1914. Special pathology and therapeutics of the diseases of domestic animals. Authorized American ed., from 3. revised and enlarged German ed. John R. Mohler and Adolph Eichhorn, editors. v. 2, xvii + 1018 pp., 163 figs., 5 pls. 4°. Chicago.
- Macdougall, R. Stewart. 1918. Insect and arachnid pests of 1917. Tr. Highland and Agri. Soc. Scotland, Edin., 5. s., v. 30, pp. 56-96, figs. 5-24.
- Townsend, Charles H. T. 1918. New muscoid genera, species and synonymy. Insecutor Inscitiae Menstruus, Wash., D. C., v. 6 (7-9), July-Sept., pp. 151-156.

HOW TO RAISE STANDARDS IN VETERINARY EDUCATION.

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(Continued from Page 139.)

III. d. OTHER ACTIVITIES OF THE COUNCIL ON MEDICAL EDUCATION.

The following extracts from the "Report of the Council on Medical Education of the American Medical Association," June 10, 1918, describing the scope of the Council's work, may well serve as guides to a future "Council on Veterinary Medical Education of the American Veterinary Medical Association":

"PRESENT SCOPE OF THE COUNCIL'S WORK.

During the fourteen years since the Council on Medical Education was established its work has developed and broadened under the direction of the secretary of the Council:

(a) Statistics are collected each year regarding the successes and failures of physicians at examinations conducted by state medical licensing boards. This material is tabulated and published in April each year in the State Board Number of *The Journal*.

(b) Statistics are collected each year in regard to medical colleges, students and graduates in the United States and Canada. These statistics are tabulated and published in August each year in the Educational Number of *The Journal*. Information also in regard to foreign medical colleges is being regularly obtained and kept on file.

(c) During the last five years the secretary of the Council has also had supervision of the American Medical Directory. This is a logical arrangement since so much of the data going into it is regularly obtained by the Council.

(d) The biographical index of physicians of the United States, which was begun with the publication of the American Medical Directory, is now under the direction of the secretary of the Council. Official information in regard to the graduation and licensing of each physician, which is regularly obtained, enables the Council to keep the biographical index of physicians up to date. This file now contains cards for 152,000 physicians of the United States and Canada.

(e) Since 1910 a register of medical students has been kept by the Council. This consists of an index showing full data regarding medical students from the time they enter the medical school. When the student has graduated, has obtained a license and has secured a location, his card is transferred to the biographical index of physicians. The information in this file is such that, should the records in any of the colleges be destroyed by fire or otherwise, the Council could replace the essential data regarding the students.

(f) The "Personal File" of information regarding physicians has thus far been kept up by various departments of the Association, but has always been an important adjunct to the biographic index of physicians. Recently, through the urging of the Federation of State Medical Boards, arrangements have been made to enlarge this file, so as to make the Council's headquarters a central bureau of information, especially in regard to illegal practitioners of medicine.

(g) The Council keeps in touch with all state licensing boards, noting changes in the personnel of those boards and in the requirements regulating the practice of medicine in the various states, particularly in regard to the educational standards enforced. At certain intervals information regarding the requirements to practice medicine in foreign countries is also obtained, through the American ambassadors or consuls in those countries. On the basis of this information a book of "Laws (Abstract) and Board Rulings Regulating the Practice of Medicine in the United States and Elsewhere" is compiled by the Council and published each year.

(h) Three tours of inspection of all the medical colleges in the United States have been completed, and of certain medical colleges six or more inspections have been made. Of the medical schools of Canada, two tours of inspection have been made. The classification of medical schools is published at frequent intervals in *The Journal of the American Medical Association* and in pamphlets. It is revised each year in accordance with changes made in the ratings of individual colleges.

(i) The Council conducts an annual conference on medical education and licensure. The conference has grown until it has drawn to it the annual meetings of other educational agencies, resulting in what might be termed an annual congress on medical education and licensure. This congress is now participated in by the Council, the Association of American Medical Colleges and the Federation of State Medical Boards of the United States. Other educational bodies are also holding meetings during the time of the conference. This annual conference has been the "open forum" where educational standards and other problems relating to medical education have been brought up for discussion. These conferences have resulted in securing united action by the various agencies interested in medical education, which accounts partly for the rapid progress since the Council was organized.

(j) From the beginning of this work the Council has carried on a campaign for higher standards of preliminary education, not only with medical colleges but also with state licensing boards.

(k) Since 1913, of the annual reports of the United States Bureau of Education, the chapter on medical education has, on request, been furnished by the secretary of the Council.

(l) The improvements resulting from the Council's work, through its conferences, its classifications of colleges and its campaign for standards of education, has made the Council an important factor in the standardization of high schools, and, more recently, of colleges of arts and sciences. Several years ago an effort was made to ascertain whether an education in an approved four-year high school was actually being required for admission by medical schools. More recently, under the increased entrance standard, it became equally essential to ascertain whether the medical school was actually requiring two years of work in an approved college of arts and sciences. In 1912 the

secretary of the Council collected the material for the preparation of a list of approved high schools, the list to include only those high schools which were accredited by the various state universities. It was found unnecessary to continue that work, however, since Dr. Kendric C. Babcock, then specialist in higher education of the United States Bureau of Education, consented to take it up. During the last two years the Council has compiled a list of approved colleges of arts and sciences, basing that approval on the list of colleges approved by standardizing agencies in whose methods the Council has confidence. This list by the Council may also be unnecessary at a later time when the Bureau of Education or other agencies shall be in position to compile such a list and keep it up to date.

(*m*) At the beginning of its work the Council published two standards, one for immediate adoption by the medical schools and state boards. The first was for immediate adoption and advocated a four-year high school education, a four-year medical course, and an examination for the license to practice. The second, then termed the "ideal" standard, advocated a year of preliminary collegiate preparation, including courses in physics, chemistry and biology, a four-year medical course and a year's internship in a hospital, preceding the examination for the license. This ideal standard has been exceeded in the matter of preliminary requirements, since two years of college work, instead of one, has proved to be the most satisfactory arrangement in this country. There remains the general adoption of the hospital intern year to entirely fulfill the requirements of the ideal standard suggested by the Council in 1905. Special effort in this direction is now being made. In 1914 a list of hospitals considered in position to furnish acceptable internships was prepared and published. During 1915 this list was carefully reviewed by state advisory committees and in 1916 a revised edition was published. At the annual meeting in 1917 the House of Delegates adopted the recommendations of the Reference Committee on Medical Education that \$2,500 a year for three years be appropriated to further the work of investigating and standardizing hospitals. This increased appropriation has been granted by the board of trustees. The work will be advanced, therefore, definite standards will be fixed and a limited amount of hospital inspection will be done. In this work, the Council will coöperate with medical colleges, state licensing boards and other interested agencies.

(n) The Council has naturally kept itself fully informed regarding the various medical cults and has been in position to furnish reliable information in regard to them where such information was needed. Most of the cult schools have been inspected and first hand information regarding them is available, especially in regard to some of them which during the last year or so have received the legal right to grant M. D. degrees. On account of (a) the lack of, or exceedingly low entrance requirements; (b) the lack of teachers who have had a complete medical training; (c) the failure to study and recognize the various factors entering into the causation of diseases; (d) the resulting failure to ascertain the effective therapeutic measures which might be used, and (e) the lack of adequate laboratories, laboratory equipment, hospitals and clinical material—on account of all these deficiencies, no cult college could be considered as equal to the average medical college rated in Class C. The chief objection to the medical cult colleges has not been to the medical cults *per se*, but to their lack of, or seriously low, educational standards.

(o) The headquarters of the Council have, in fact, become a clearing house of information in regard to medical education, medical licensure, medical cults and other matters pertaining to these subjects. The Council has at its headquarters information which cannot be obtained in any other place. The use which state boards and others are making of this information has grown tremendously, as indicated by the voluminous correspondence that comes regularly to the headquarters of the Council. A tremendous amount of information goes also to prospective medical students and the demand for the pamphlet entitled "Making the Right Start," which was prepared especially for prospective medical students, has been constantly increasing. The volume of correspondence required to answer inquiries is already large and is steadily increasing. Much of the information is now regularly published in the *Monthly Bulletin* of the Federation of State Medical Boards, which goes to all members of all state boards.

THE COUNCIL'S PERMANENT FILES.

The files of data at the headquarters of the Council are as follows:

(a) Announcements of medical schools of the United States. These files are being kept up to date and so far as possible back

numbers of the announcements of schools have been obtained. Catalogues of many of the foreign medical schools are also on file.

(b) Lists of medical graduates: This file consists of alumni lists, either in printed or card index form, which are complete for all schools existing as well as for the majority of schools which have become extinct. For the extinct schools our information is occasionally being added to and our files are gradually becoming more complete.

(c) Information in regard to foreign medical colleges, foreign graduates and the legal requirements for practice abroad.

(d) Biographical index of physicians of the United States and Canada. Every card shows the personal and educational history of each physician. Official data regarding the medical graduation and licensure of each physician is shown.

(e) Biographical card index of medical students enrolled in the medical colleges of the United States and Canada. Reports are received each year which keep this index up to date.

(f) Data obtained from the inspections of all medical colleges.

(g) Miscellaneous pamphlets bearing on medical education.

(h) Catalogues and other information in regard to medical cults. Much information has been obtained by actual inspection.

THE COUNCIL'S WORK AND THE WAR.

As already stated, by the time this country entered the world war the reforms among medical colleges had made sufficient progress that for several years most of the medical graduates had benefited from the improved conditions in medical schools, such as the higher entrance requirements, the more skilled teachers, the better laboratories and laboratory equipment, the better clinical material and the greatly improved methods of medical teaching. It is the graduates of the last several years also, who, in largest proportions, have entered the government medical services. But the Council and the information it has collected have rendered other important services to the government, which are briefly enumerated as follows:

(a) When the selective service law was enacted, it made no provision for the exemption of medical students. In the Medical Students' Register, the Council had the home addresses of the majority of the students enrolled during 1916-1917, and was able by direct correspondence to secure reliable information

showing the proportion of students who would be taken by the draft. The data collected had much to do with the provision made later whereby drafted students were permitted to enter the enlisted reserve corps and to remain in the medical colleges until they should complete their medical training.

(b) Only such students were eligible for admission to the enlisted reserve corps as were enrolled in "well-recognized" medical colleges, which were defined as those recognized by the majority of state medical licensing boards. The only information immediately available by which it could be decided which colleges were so recognized, was Table D published last year in State Board Statistics (similar to Table 1 in this report) and which was based on reports signed by the various state board officers.

(c) The Council's files of information in regard to medical colleges were also placed at the disposal of the Surgeon-General, and the secretary of the Council has cooperated in inspecting and furnishing reports to the Surgeon-General regarding a number of medical schools.

(d) The biographical information in the files at the Council's headquarters has been used for the Surgeon-General in checking the qualifications of applicants for the medical reserve corps before commissions were granted. That information has also made possible the compilation and publication of the Honor Roll of Physicians in the campaign for the enlistment of additional medical officers.

(e) The Council's files of information in regard to standards of preliminary and medical education have likewise been utilized by the Surgeon-General's Office. This information included, also, a list of the approved colleges of arts and sciences and a list of hospitals considered in position to furnish acceptable internships, both of which lists were compiled by the Council.

IN CONCLUSION.

The above outline of the Council's work shows the character of the information gathered and the great service it has rendered to the public, to the medical profession, and, more recently, to the government. Some idea, also, can be formed of the influence which, through its Council on Medical Education, the American Medical Association is wielding in the educational world. Through the work of the Council the medical profession is being

recreated by shutting off the supply from low grade colleges and increasing the output of high grade, well equipped colleges. Under the increased standards of preliminary education and the highly improved methods of teaching, the entire medical profession will be on a much higher plane of education, culture, training and technical skill than has ever before been true. This will place so wide a zone between the qualifications of physicians and those of followers of the various cults, that all laymen of average intelligence will be able to note the difference. Of more importance, however, because of this successful campaign for an improved medical education, the average physician will be able to render a far better service to the public and to the soldiers and sailors who are fighting with our allies in the world war.

Respectfully submitted.

Council on Medical Education,

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IV. BIBLIOGRAPHY.

1. Pritchett, H. S.; Medical Progress; in Seventh Annual Report, Carnegie Foundation for the Advancement of Teaching; 1912, p. 127. (Criticises classification of medical schools as too lenient.)
2. Pritchett, H. S.; The classification of medical schools; in Ninth Annual Report, Carnegie Foundation for the Advancement of Teaching; 1914, p. 61. (Criticism of the classification.)
3. Flexner, A.; Medical Education in the United States and Canada; in Bulletin No. 4, Carnegie Foundation for the Advancement of Teaching; 1910, p. 176.
4. Colwell, N. P.; Medical Education; 1916-18; in Bulletin, 1918, No. 46; Bureau of Education, Department of the Interior.
5. Council on Medical Education; Choice of a Medical School; in the Journal of the American Medical Association, April 13, 1918, pp. 1084-1085, and August 17, 1918, pp. 536-538, 546-553. Also reprinted in pamphlet form.

6. Report of the Council on Medical Education of the Amer. Med. Ass'n., to the House of Delegates, June 10, 1918. Reprinted from the *Journal of the American Medical Association*, June 15, 1918, Vol. 70, pp. 1844-1851, and p. 1855.
7. Report of the Council on Medical Education of the Amer. Med. Ass'n., to the House of Delegates, June 9, 1919. Reprinted from the *Journal of the American Medical Association*, June 14, 1919, Vol. 72, pp. 1751-1761, and June 21, 1919, p. 1832.
8. Office of the Secretary United States Department of Agriculture; Circular 128. Regulations governing entrance to the Veterinary-Inspector examinations. Effective on and after September 5, 1918.
9. Stange, C. H.; Report of Committee on Entrance Requirements; JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, Vol. 8, pp. 234-237, 1919.

THE INFLUENCE OF THE ENDOCRINE GLANDS UPON THE ANIMAL BODY.*

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The body is managed by the endocrine glands contained therein. You have an automobile, and it is run by gasoline of one kind, in spite of the fact that it has a component mechanism, if you are short of gasoline or have a poor quality of gasoline, that invalidates the value of the automobile. But in the animal body there are many kinds of gasoline given off by many glands, each gland producing many secretions we do not as yet understand, but each gland and its special components has definite specific action, and every animal from the time it is born until the time it dies is under the influence of these many kinds of elements—some of them having to do with the development of the bones, some with the development of the teeth, some with the development of the body and later on with the development of the nervous system, and later, with the introduction of sex factors—with reproduction. Later in life these elements have to do with the preservation of these structures and functions which constitute the body; and if the gasoline element which is given off by these glands becomes under or over active there is a

* Read before Missouri Valley Association, July, 1919.

disturbance of the specific functions these component parts are supposed to perform, and as these glands are dependent upon each other the upset of one disturbs the rhythmic action of the others; so that an animal during its development and maturity keeps in action as its glands keep in normal action, and as it approaches the years of senility its glands change and its activity changes, so that if it lives long enough it is almost back to where the functions started in the early life.

We must not forget that the pituitary and thyroid have much to do with the development of the bones and the body, as may be seen from cretinism in the human family. The development of infantilism is traced in many cases to the lack of proper developmental stimuli by the thyroid or pituitary glands. The development of the status lymphatus shows the importance of the thymus and its associated lymphatic activities. The thymus is supposed to decrease at the time when the gonad functions develop. Hence among its functions are supposed to be that of inhibiting a too early development of the sex glands. Now there is a different development in the male than in the female, and that is explained by the fact that the secretions from the testes so act on the other glands of the body, especially the anterior pituitary and adrenal cortex, so as to increase their activity and give a heavier bony framework, larger head, larger feet, and a larger conformation generally; while the ovaries, not affecting the other glands to the same extent, are accompanied by a lesser stimulation of the anterior lobe of the pituitary and other glands controlling the development of the bones, and of the body, and the result is a smaller structure. Hence the difference in the male and the female conformation and disposition. The anterior lobe of the pituitary acts more specifically in the male than in the female; the posterior lobe acts more characteristically in the female than in the male.

Consider now the stage of puberty, the time when the female first comes into the period of œstrum. In the experience of many it has been noticed in some animals this period comes on early, while in others this period comes on late in life. In the early age of puberty the period of œstrum comes on at irregular intervals; at the same time in some of these young animals you will notice neurotic symptoms, which have up to this time been foreign to their disposition; they will develop habits at the time of œstrum which are vicious in character and the animal becomes

almost unmanageable. The anomalies of œstrum, these nervous symptoms, are due to the fact that the ovary is asserting itself as a new and powerful member of the endocrine family, upsets the other members and relationships, until finally, in the vast majority of cases, harmony is established. If harmony is established quickly, the period of œstrum comes regularly and there are no annoying symptoms. If harmony be established slowly and with difficulty you have more of the above named annoyances. If no permanent smooth action is established, you have a condition where every œstral period acts badly on the system.

Next is the stage of œstrum, a period in which the ovaries, pituitary, and thyroid are concerned. At every menstruation these three act or react, and according to the harmonious action of the three there will either be a normal or an irregular œstral period. The glands which preside especially over œstrum are the ovaries. Without ovaries no menstruation takes place. The ovaries are more or less under domination of other glands of the body. The thyroid has an important part in preserving and aiding the normal action of the ovary and uterus. The pituitary gland is intimately connected with the genital apparatus. At every œstral period the thyroid reacts to the menstrual stimuli and the posterior lobe of the pituitary undoubtedly plays its part. If the posterior lobe of the pituitary reacts excessively during the menstrual stimulus initiated by the ovary, then we find a long drawn out œstral period.

Why is pregnancy characterized by the absence of the œstral period? When the fecundated ovum settles in the intrauterine lining it nests and embeds in the decidua. As it grows, the outer layer of the ovum, which is called the trophoblast, invades the surrounding tissue and digests it by enzymic action. Cells from the trophoblast are given off immediately into the circulation, and this giving off continues as the ovum grows and the chorionic villi develop and as the subsequent placenta comes into being. This secretion produced by the outer layer of the cells and the subsequent chorionic villi and the subsequent placenta has the power to nullify the menstrual stimulus initiated by the ovary and aided by the thyroid and the pituitary. During the entire period of pregnancy, the ovaries, the thyroid, the pituitary, the adrenals, and other protective glands of the body are fighting against the secretion introduced by the growing ovum.

Pregnancy has a remarkable stimulating effect on many individuals; it is no infrequent thing to see an animal that is in an emaciated, depraved condition, fatten rapidly after conception; even the disposition is changed, the whole nervous system undergoes a change, the animal that was restless and unmanageable now becomes quiet and docile; in the young individual we see even a greater change during her first pregnancy—we see an increase in the size of bone; they grow, mature, and before the end of pregnancy they change from a spindling colt into a well-matured animal. Why is all this? What has brought about this wonderful change? The anterior pituitary, the adrenal cortex, and the thyroid are stimulated by the entrance into the endocrine family of a new secretion, the placental secretion which has stimulated the other members to greater activity.

What is parturition? Parturition is a crisis, and in that crisis certain glands—particularly the ovary, thyroid, and the pituitary, which normally are concerned in menstruation or œstrum, and which have been inhibited by the throphoblast and placental secretions—again come into action, with the result that on the three hundred and thirtieth day (in the mare) there is a menstruation which did not take place during the duration of pregnancy. Something occurs which brings ovary, thyroid, and pituitary back into their old function. The inhibiting element is gone. When we come to analyze parturition or labor we find it to be only a menstruation. The process of dilatation of the cervix, expulsion of the non-fecundated ovum, loss of blood, especially in the bitch, are miniature reproductions of the various processes which occur in parturition. Therefore we have pituitrin acting when the patient is in labor, whereas it does not act until the crisis occurs. If given when the patient is in labor it increases the pains, adds force, and its action is generally all that can be desired. Some inhibiting element has disappeared or some sensitizing element has come into being. If you give pituitrin before the animal is in labor, or before her expected time, it may bring on labor pains, but in a large majority of instances it has no further effect. Why does it act when given by hypodermic during labor or at the time when the patient is supposed to go in labor, and not at an earlier date? Because labor is a crisis, and you will find that pituitrin, given in proper doses and at proper intervals during labor, especially in the sow, when the foetuses are so far within the cornua of the uterus

they cannot be reached with the forceps, that pituitrin given at this time will cause contractions which will produce results in many instances without further help. In the mare, especially if a primipara, and if the delivery be a normal one, and as in many cases uterine inertia develops, a few hypodermic injections of pituitrin will produce a normal parturition.

Let us now consider for a moment the question of abortion; not that of the infectious type, but the repeated, habitual kind with which we come in contact so often. In all these cases, where abortion occurs about the same time during pregnancy, if we could treat these patients and rely on the endocrine treatment, giving the individual trophic support which she needs and increasing the resistance to those factors which tend to produce abortion, we would be uniformly successful. What is the cause of these repeated abortions? The ovary, thyroid, and the pituitary, especially the pituitary, are trying each month to produce the œstral period; the placenta is trying for three hundred and thirty days to inhibit it. If the ovary, thyroid, and pituitary, especially the pituitary, are not too energetic the placental element nullifies this tendency, holds it up for three hundred and thirty days, until the parturition ensues at the regular time. If the placental element cannot inhibit this tendency, there is a menstruation, which is an abortion, early in pregnancy. So we should give to these patients the secretions which have a tonic influence and a trophic effect; we should never give pituitrin extract in any form, for fear of the too early evidence of the action of the gland.

THE PREPARATION AND DISTRIBUTION OF TUBERCULIN BY THE BUREAU OF ANIMAL INDUSTRY.*

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Department of Agriculture.

The eradication of tuberculosis in cattle would certainly be a hopeless task without the aid of tuberculin. In fact the tuberculin test is the very corner-stone upon which rests all of the vast undertaking which this conference is called to consider. Under these circumstances it is proper to give some consideration to the nature and methods of production of tuberculin.

* Presented at the Tuberculosis Eradication Conference of State and Federal Live Stock Sanitary Officials, held in Chicago on October 6 to 8, 1919, inclusive.

In the literature we may find described a great variety of tuberculins, most of which were originally produced for use in treating or diagnosing tuberculosis in man. In *veterinary medicine* three forms of tuberculin are usually recognized. They are known respectively as "subcutaneous," "intradermic," and "ophthalmic" tuberculin. All of these three forms of tuberculin are prepared from the concentrated tuberculin produced after the method described by Robert Koch in 1890. This is frequently referred to as "Koch's Old Tuberculin," "Old Tuberculin," "Concentrated Tuberculin," and also as "O. T.," meaning old tuberculin. A specific designation is necessary to distinguish this product from tuberculin produced in other ways, as well as from diluted forms of the "Old Tuberculin." The method of producing "Old Tuberculin" has remained practically unchanged since its introduction in 1890.

CULTURES USED IN MAKING TUBERCULIN.

Pure cultures of the bacillus of tuberculosis are required. Either the human or bovine type of bacillus may be used. (Tuberculin has also been prepared both from the avian bacilli and from bacilli obtained from cold-blooded animals, but such products are regarded as unsuitable for general practical use.) It seems to be well established that tuberculin prepared from the human type of bacilli is quite as reliable for diagnosing bovine tuberculosis as that prepared from the bovine type of bacilli. The human type grows upon artificial culture media far more readily and abundantly than the bovine type. For these reasons *the human type of bacillus*, that is, an organism obtained from a case of human tuberculosis and possessing the well known characteristics of the human type of bacillus, *is used generally if not universally* for the production of the tuberculin which is employed to detect tuberculosis in cattle.

The pure cultures are secured usually by inoculating guinea-pigs with sputum or diseased tissues from cases of human tuberculosis and the pure cultures of the tuberculosis bacilli are obtained from the tuberculous organs of the guinea-pig, by transferring bits of the infected tissue to tubes containing a medium suitable for the growth of the tubercle bacillus. Once a growth is well established outside of the animal body the micro-organism may be propagated with ease. Some cultures grow more luxuriantly than others. Those which grow rapidly and abundantly are best suited for the preparation of tuberculin. A good growing

culture of the tubercle bacillus having been obtained, the preparation of the tuberculin may be begun.

THE CULTURE MEDIUM AND THE PREPARATION OF OLD TUBERCULIN.

A clear broth is made from lean beef by extracting it with water. Peptone, glycerine and acid potassium phosphate, or sodium chloride are added in suitable proportions, and the broth is made about neutral to litmus by the use of sodium hydrate. Finally, after the broth is rendered perfectly clear by filtration, it is distributed in flat bottom flasks. The flasks of clear broth are then sterilized in an autoclave, after which they are ready for seeding with the tubercle bacilli. This is done in specially constructed, dust-proof and draft-proof rooms. A small flake of tubercle bacilli is transferred, from a young growing culture to the flask to be seeded, in such a manner as to cause it to float on the surface of the culture medium. The seeded flasks are then placed in an incubator which is kept at an even temperature of 100° F. The bacilli soon begin to grow and the pellicle on the surface will be seen to have increased perceptibly in size after a week. It then spreads rapidly over the entire surface of the culture medium, becoming finally wrinkled and opaque and of a faintly yellowish white color. These cultures, if conditions are favorable, are fully grown or "ripe," about 8 weeks after seeding and they are then used to make up the tuberculin.

The "ripe" cultures are heated in a steam sterilizer at 212° F. for 4 hours. This serves to kill all of the bacilli and at the same time to further extract from them the active principle of the tuberculin.

After the cultures are killed the entire contents of the flasks are poured into large open dishes which are heated on a steam bath until the volume is reduced to 1/10 of the original volume of the culture medium. This thick syrupy liquid is then filtered until clear and is finally sterilized.

This thick fluid thus obtained is the "Old Tuberculin" of Koch, or "O. T."

RATIO OF SURFACE OF CULTURE MEDIUM TO TOTAL VOLUME.

At this point I wish to call attention to a detail in growing cultures for tuberculin production. While this is a detail, it is of the greatest importance.

We have just seen that the amount of "Koch's old tuberculin" obtained from a given lot of cultures depends upon the amount of broth placed in the culture flasks, whereas the *strength* or *potency* of the tuberculin is derived exclusively from the bacilli that grows on the culture medium, and it must be clear also that the more the growth and the greater the number of bacilli on the surface medium the richer the tuberculin* will be in the reactive principle.

With these two facts in mind, namely: 1st, *that the amount of tuberculin to be produced is dependent upon the culture medium,** and 2nd, *that the activity of the tuberculin is dependent upon the amount of growth of tubercle bacilli upon that medium*, it is clear that tuberculin of the maximum potency can be produced only by securing a maximum of growth per unit of culture medium and uniformity in the strength of the concentrated tuberculin can be obtained only by the general adoption of means to secure this maximum growth per unit of culture medium.

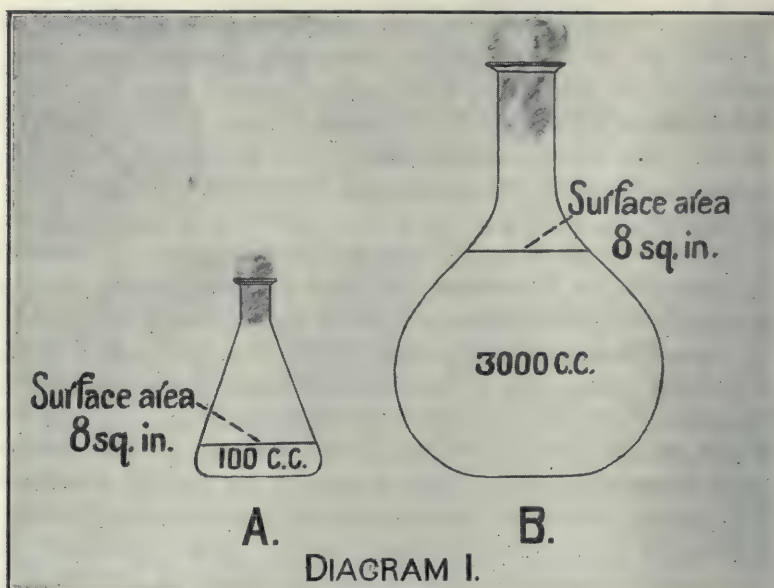
Now the tubercle bacillus grows only upon the *surface* of the culture medium, hence the amount of growth per unit volume of medium must within certain limits bear a very direct relation to the surface exposed for growth. Actual experiments have shown that this is true and it is for this reason that the Bureau's tuberculin is always produced from cultures in which the optimum surface area is exposed. It is our opinion that at least 5 sq. inches of surface should be provided for each 100 cubic centimeters of tuberculin.

Diagram 1 illustrates the effect that the surface area of the culture medium may have upon the potency of the tuberculin. Flasks *A* and *B* have the same surface area but flask *B* contains 30 times as much culture medium as flask *A*, hence 30 times as much tuberculin (O. T.) would be made from *B* as from *A*. It is equally evident that the tuberculin from *A* would be approximately 30 times as potent as that produced from *B*.

KINDS OF TUBERCULIN.

We have already seen that the three forms of tuberculin used in veterinary practice are derived from the concentrated "Old Tuberculin" of Koch. It remains to refer briefly to these three forms of tuberculin.

* This is merely an arbitrary rule first laid down by Koch and since universally followed.



I. SUBCUTANEOUS TUBERCULIN.

The tuberculin used for subcutaneous injections is merely the old concentrated tuberculin, diluted with water containing about 0.5% of carbolic acid. The extent of this dilution is varied somewhat by different laboratories. Some even supply the tuberculin in the concentrated form, leaving it to the veterinarian to make the dilution. The subcutaneous tuberculin distributed by the Bureau of Animal Industry is diluted so that 4 cubic centimeters contain 0.5 gram of old tuberculin. Under the authority contained in the Virus-Serum-Toxin Act of 1913, the Bureau of Animal Industry requires that all establishments which manufacture or distribute tuberculin under a federal license shall show on their labels the amount of concentrated tuberculin (O. T.) contained in the solution that is sold. In the case of various drugs, as for example laudanum, tincture of Nux Vomica, and Fowler's Solution of Arsenic, the physician or the veterinarian is able to determine the proper dose because he knows the amount of the active substances, such as morphine, strychnine or arsenic that each contains. The specific substance that causes the tuberculin reaction has never been isolated, so we regard the concentrated tuberculin (O. T.) as the active substance and require that the amount of this in the various commercial preparations be shown on the label for the information of the vet-

erinarian. I think it should be emphasized that the veterinarian who is making tuberculin tests should think, when he is determining dosage, in terms of "Old Tuberculin" and not in cubic centimeters of the product he happens to be using.

II. INTRADERMAL TUBERCULIN.

Comparatively little use has been made of the intradermal tuberculin test in the United States and the same is true of the ophthalmic test. The present great campaign against cattle tuberculosis has emphasized the need for all possible means for detecting diseased animals, hence the interest in these two tests is rapidly increasing.

Up to the present time no definite form or standard of strength for intradermal tuberculin have been recognized; experimenters in different parts of the world have used all kinds and dilutions of tuberculin for making the intradermal test. The practice of commercial houses in selling tuberculin for the intradermal test varies greatly. However, all forms are derived from the concentrated "O. T." The "O. T." has been used as such or diluted to $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{10}$ strength. At times the dry form of tuberculin is used in 5 or 10% solution. There is need for greater uniformity in the strength of intradermal tuberculin but this can be attained only by careful field investigations which should indicate the best concentration. There are indications that rather concentrated solutions are the most dependable. The Bureau does not now make a regular distribution of intradermal tuberculin. That which we have sent out for experimental use is equivalent in strength to a 50% solution of "O. T." The dose of this is from 0.1 c. c. to 0.2 c. c., which is equivalent to a dose of 0.05 gram to 0.1 gram "O. T." At times the subcutaneous tuberculin which the Bureau supplies has been used for intradermic testing and it has without question given good reactions in many cases just as very small doses of tuberculin given subcutaneously will reveal many cases of tuberculosis. Nevertheless we know that in subcutaneous testing some cases are missed if the dose is too small and the same is believed to be true of intradermal testing. The Bureau's subcutaneous tuberculin is not intended for intradermal use.

III. OPHTHALMIC TUBERCULIN.

Ophthalmic tuberculin, like intradermal tuberculin, is found in various forms. At times the concentrated O. T. is used but

more usually some of the so-called "purified" or "precipitated" tuberculins are chosen. The "precipitated" tuberculins of commerce are prepared by adding a given volume of Koch's old tuberculin to 10 or 20 volumes of 95% alcohol. The alcohol causes a precipitation of the active principle of the tuberculin, together with practically all of the inert substances which compose the broth upon which the bacilli are grown. This precipitation serves merely to separate the glycerine from the other constituents of the culture medium. The precipitate that is caused by the alcohol is dried and furnished to the trade in bottles usually accompanied by a separate bottle of sterile salt solution, which when added to the dry precipitate makes a five or ten per cent solution.

It appears that there is a need for determination of the most effective strength and the most suitable form for dispensing ophthalmic tuberculin. No doubt the variety of opinions as to the value of this test are in part at least due to the variety of tuberculins that are employed.

Irritating preservatives such as carbolic acid are never used in ophthalmic tuberculin.

In the Bureau's laboratories we have given considerable attention to the refining of Koch's old tuberculin and have succeeded in separating a precipitate of considerable potency and purity. This has been made into discs for the ophthalmic test. Each $\frac{1}{2}$ grain disc contains approximately the equivalent of 0.1 gram (or 2 drops) of "O. T." In practice these discs are employed by inserting 1 into the conjunctival sac. This is for the purpose of sensitization. After an interval of from two to four days, one or two more discs are placed in the same eye. I believe these discs have given quite good results; in fact on the whole they seem to have given more satisfaction than any other form of ophthalmic tuberculin that the Bureau's inspectors have tried.

ACTIVE PRINCIPLE AND METHODS OF STANDARDIZATION.

Although the subject has engaged the attention of investigators in all parts of the world for years the exact nature of the substance in tuberculin that causes reactions in tuberculous animals is unknown. The most we can say is that it is probably a low form of proteid matter. This active substance is found in the broth on which the bacilli have grown and it may also be extracted from the bodies of the bacilli themselves.

Since we know so little of the exact nature of this active substance we naturally are unable to measure with exactness the amount that is present in a given tuberculin.

The only method that serves to gauge even approximately the strength of tuberculin is based upon the fact that tuberculous guinea pigs are very susceptible to even small doses of tuberculin. A small dose causes their death within a few hours. In standardizing tuberculin by this method a large number of guinea pigs are infected with tuberculosis and after the disease has progressed to a certain point a number of the pigs are given graduated doses of a tuberculin of known potency and a similar number are given graduated doses of the tuberculin to be tested. In this way it is ascertained whether the sample to be tested will kill the tuberculous guinea pigs in as small dose as the standard sample.

This method is very difficult, cumbersome and costly. It is not used, so far as I am aware, by any producing laboratory in the United States.

The best assurance of a potent tuberculin is secured by using a vigorous culture propagated so as to secure the maximum growth, the greatest care being also given to sterilization, evaporation and final dilution.

DISTRIBUTION OF TUBERCULIN BY THE BUREAU OF ANIMAL INDUSTRY.

The Bureau of Animal Industry began the preparation of tuberculin in 1893, shortly after it was first used abroad to diagnose tuberculosis in cattle, and during all the years, down to the present time, has continued to supply tuberculin for official use to federal, state, county and municipal officers. The accompanying chart shows the amounts distributed yearly during the past 21 years.

As may be seen, the amount of tuberculin distributed has increased, especially during the last 4 years, while during the *last fiscal year* the increase has been as great as during the preceding 3 years combined. We distributed during the last fiscal year more than 2,300,000 c. c. of subcutaneous tuberculin besides considerable quantities of experimental ophthalmic and intradermic tuberculin. At the present time we are producing subcutaneous tuberculin at the rate of 6,900,000 c. c. per annum, or 3 times more than was distributed last year.

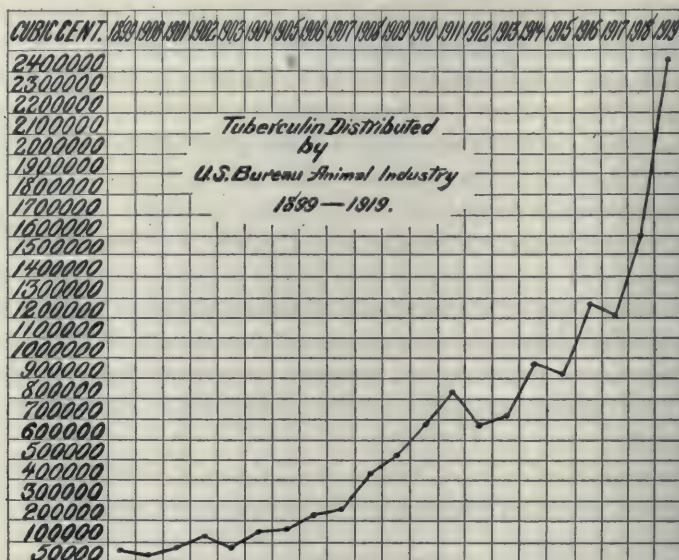


CHART I.

This means that it is necessary each working day to prepare broth and fill and sterilize 300 flasks of culture media. Each day 300 flasks must be seeded with tubercle bacilli or an average of 1 flask every minute and a half during each working day. We must keep growing in our incubators about 16,000 flasks of tubercle bacilli. We believe that the Bureau laboratories are now the largest producers of Bureau tuberculin in the world.

It is not within the scope of this paper to discuss the use or the effectiveness of tuberculin as a diagnostic agent but it may be noted that a recent survey of the records of 51,210 reacting cattle shows that visible lesions of tuberculosis were found in 49,414, almost exactly 96.5%. When we consider the difficulties which ordinarily surround the diagnosis of disease, this is a truly remarkable showing. Had it been possible to supplement the microscopic examination with laboratory studies even this high figure would certainly have been materially increased and we are justified in concluding that a reaction to tuberculin for all practical purposes means tuberculosis.

Last of all it is worth remembering that, as important as the standardization of the tuberculin undoubtedly is, there is another factor that should be standard also, and that is the inspector who makes the test. No matter how potent and reliable the

tuberculin is, the best result cannot be obtainable unless the tuberculin is applied with care and foresight nor unless the results of the test are given intelligent interpretation by experienced veterinarians.

THE PURIFICATION AND CONCENTRATION OF HOG CHOLERA SERUM.*

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The work discussed in this article was outlined and undertaken with the object of determining whether or not it was feasible from a practical, economic or commercial standpoint to subject anti-hog cholera serum to a refining and concentrating process analagous to that used in making the so-called globulin products from anti-diphtheritic and anti-tetanic sera for use in human medicine.

It was realized early in the work, in fact to some extent before operations were started, that any extremely elaborate or refined technique would be inapplicable to the object in view, so that nothing was undertaken but comparatively simple—in fact, almost crude—methods of precipitation with ammonium sulphate, solution of the precipitates obtained and filtration of the same.

The literature upon the subject of anti sera concentration and purification in general is very extensive and no attempt at its review will be made. It has to do mostly with products used largely in human medicine and, except as to the chemical processes involved, has little bearing on the subject under consideration. A few publications dealing with the concentration of anti-hog cholera serum have, however, appeared. Eberson¹ gives in considerable detail his work and results, which latter were quite successful from a scientific point of view, but shed little light on the practicability of his process for commercial quantities of serum—a feature which he expressly states he had not attempted to work out. Heinemann² merely mentions the fact that he had successfully concentrated the protective properties of anti-hog cholera serum into one third of the original bulk by a method he details in the same article. Reichel³ reports the successful

* Results of studies conducted at the Nevada Agricultural Experiment Station under the Adams Fund as Project 17, beginning July 1, 1915. Publication authorized by the Director.

concentration of hog cholera serum, presumably in fairly large quantities, but gives little detail as to the process or the difficulties encountered. The diagram published, however, indicates a rather long and complex method of procedure hardly applicable to a process where low cost is absolutely essential.

SOURCE AND QUANTITY OF RAW MATERIAL.

As before stated, this work was planned for conduction on a scale such that the quantities of material processed would be sufficiently large for the results obtained to indicate the availability or otherwise of the process for commercial purposes.

The raw material used was all derived from twelve basic lots of hog blood totaling 68,175 mls. in amount, which were later subdivided more or less for variations of the refining and concentrating processes.

Of these twelve basic lots, one was ordinary hog cholera serum of the defibrinated whole blood type preserved with 0.5 per cent phenol in good condition; one was a lot of the same material which spoiled in storage due to the improper addition of preservative and which will be briefly discussed later. The other ten lots of material were freshly drawn blood, eight being taken from hyperimmune hogs and two collected at a packing plant for experimental work on technique only, no antibodies being considered.

PREPARATION OF RAW BLOOD FOR PRECIPITATION.

In view of the well established fact that the cellular elements of the blood of hogs hyperimmunized with hog cholera virus contain no antibodies, we considered it best to remove them before precipitation, carrying out the latter procedure on the clear serum or plasma only, the labor required for so doing being more than offset by the saving in amount of chemicals used for precipitation and the greater ease of carrying out the latter procedure with material free of hæmoglobin and cellular débris.

Ten of the twelve lots of raw material worked with being available as freshly drawn blood, several lines of procedure were tried to free it of fibrin and cellular elements before precipitating, as follows:

Two lots, consisting of the blood from twelve hyperimmune hogs totaling 16,180 grams in weight, were bled direct into 5,685 grams of 8 per cent sodium citrate solution, agitated and allowed to stand over night. So far as possible the supernatant fluid

was drawn off by syphon. The residue was then centrifuged and an additional amount of fluid secured which equaled about 40 per cent of the total recovered. The fluid plasma secured in this way contained a great deal of free hæmoglobin and as closely as it could be calculated represented in one instance 63 per cent and in the other 46 per cent of the volume of the whole blood—an average of only 54.5 per cent of actual serum recovery. While two trials are not sufficient to base a definite opinion upon, these results were taken to indicate that citration was not an efficient means of handling hog blood and other methods were adopted.

Four lots, representing the blood of 15 hyperimmune hogs totaling 21,385 mls., were prepared by bleeding into jars containing coiled wire, defibrinated by shaking, strained through gauze and treated by the method suggested by Dorset and Henley⁴ for making clear raw serum as a finished product, 1 per cent of navy bean extract and 1 per cent of sodium chloride crystals being added to the defibrinated blood, after which it was centrifuged and the clear serum poured off. The serum recovery by this method was quite uniform and averaged 74.2 per cent of the volume of the defibrinated blood, the serum recovered being only slightly discolored with hemoglobin.

Four lots, representing the blood of 16 hogs and totaling 27,510 mls. of defibrinated blood, were prepared for precipitation by bleeding into jars containing coiled wire, defibrinating by shaking, straining through gauze and adding variable amounts of a saturated solution of sodium chloride, followed by centrifugation and the pouring off of the supernatant fluid.

The percentage of actual clear serum recovered by the sodium chloride alone method varied somewhat, the average for seven mixtures into which the four lots were subdivided for salting and centrifuging being 59.6 per cent. The maximum of efficiency by the sodium chloride alone process appeared to be reached by the addition of 10 per cent of a saturated solution of sodium chloride. Amounts in excess of this did not increase the percentage or quality of the serum recovered.

The clear serum obtained by either the navy bean extract or sodium chloride alone was apparently well suited to precipitation and a product nearly, but not quite, hemoglobin-free could be obtained by either method provided the defibrination, treatment and centrifuging were carried out with sufficient rapidity.

When the attempt was made, however, to pass the raw, clear serum derived as above through a bacteria-retaining filter, a marked difference was observed. Serum recovered by the use of navy bean extract and sodium chloride was difficult and for all practical purposes impossible of filtration, while serum recovered by the use of sodium chloride alone filtered much more readily, though even it presented rather more difficulty than the average run of horse sera. This difference in filterability did not appear to persist after precipitation and solution of the precipitates had been carried out, the finished product in that case being about equally difficult of filtration regardless of the method used for securing the original clear serum.

CHEMICAL PRECIPITATION.

It seems impracticable to give in one general, comprehensive statement the results obtained by and the difficulties encountered during this manipulation, so that an attempt will be made to discuss the various features involved under more or less separate headings, illustrating each point with examples from the working sheets of individual lots.

GENERAL METHOD.

Keeping constantly in mind the fact that to have any practical value this process must be simple and free from too elaborate technique, the following general line of procedure was adopted:

The plasma obtained by one of the methods discussed above was diluted with distilled water until the mixture contained approximately 6 per cent protein. It was then brought to the desired strength of ammonium sulphate by adding a saturated solution of the latter in the required amount, after which the mixture was heated in a water bath for 1 hour, starting at about 55° C. and finishing at 59-60° C., and placed on filter papers to drain. The precipitate was washed with a moderate amount of ammonium sulphate solution of equivalent strength, and such washings gathered as part of the filtrate. Saturated solution of ammonium sulphate was then added to the filtrate in proper amount to bring it up to the required percentage content and the precipitate so formed again collected on filter papers, this process being repeated until the desired number of fractional precipitates was obtained.

The precipitates secured in this way were then brought into solution and tested for potency on test animals against hog

cholera virus. Neither solution and reprecipitation of the original precipitates was resorted to nor any further purification process beyond the rinsing with ammonium sulphate solution described.

All the fractional precipitates discussed in the next section were obtained by the general plan above. Later, after the range of precipitation was apparently established, a single precipitation was carried out. For this purpose we used a modification of the method proposed by Homer⁵, which was briefly as follows:

The clear serum was diluted with approximately one half its volume of filtered water and this mixture brought to 55 per cent saturation by adding saturated solution of ammonium sulphate in proper amount. There was then added an amount of sodium chloride crystals sufficient to bring the whole mixture up to 2 per cent sodium chloride, allowance being made for that added to the original defibrinated blood during the removal of the corpuscles. This finished mixture was then heated gradually in a water bath for two hours, starting at room temperature and finishing at 59-60° C., gentle stirring being kept up during the heating process.

The precipitate so obtained was gathered on hard filter papers readily, complete drainage being obtained in 24-36 hours, and the precipitate so gathered being a whitish, fine, homogeneous mass. Practically all of any hemoglobin present in the plasma processed passed on in the filtrate. The precipitate so obtained, after being freed from all excess moisture by pressure between pads of bibulous paper, was readily soluble in normal saline solution or water containing phenol for preservative purposes.

POTENCY OF FRACTIONAL PRECIPITATES.

In all, nine lots of highly potent serum were subjected to fractional precipitation with varying percentages of ammonium sulphate and, disregarding certain lots in which the results were not satisfactory from a technical point of view, our results confirmed the findings of Eberson¹ to the effect that the antibodies were contained in both the pseudo and euglobulin fractions and could only be entirely recovered by a saturation up to approximately 55-60 per cent of ammonium sulphate.

The following table showing the results of potency tests on the various fractional precipitates from a single lot of serum is quite typical of the general results obtained after the technique was reasonably well perfected.

TABLE No. 1.

Showing Results of Potency Tests on Original Clear Serum, Lot No. 9,
and Three Fractional Progressive Precipitates From Same.

Hog No.	Wt.	Material Injected	Dose in Mils.	Rate per lb. in Mils.	RESULT
1	83	Original clear serum*.....	18	.2	Lived
2	67	Original clear serum.....	14	.2	Lived
3	61	Original clear serum.....	18	.3	Lived
4	76	Original clear serum.....	23	.3	Lived
5	66	Original clear serum.....	26	.4	Lived
6	57	Original clear serum.....	23	.4	Lived
7	74	0-30 % fractional precipitate...	15†	.2†	Died, hog cholera, 17 days
8	66	0-30 % fractional precipitate...	13	.2	Lived
9	55	0-30 % fractional precipitate...	17	.3	Lived
10	74	0-30 % fractional precipitate...	22	.3	Lived
11	66	0-30 % fractional precipitate...	26	.4	Lived
12	55	0-30 % fractional precipitate...	22	.4	Lived
13	73	31-50 % fractional precipitate...	15	.2	Lived
14	62	31-50 % fractional precipitate...	13	.2	Lived
15	53	31-50 % fractional precipitate...	16	.3	Died, hog cholera, 13 days
16	71	31-50 % fractional precipitate...	21	.3	Lived
17	61	31-50 % fractional precipitate...	25	.4	Lived
18	53	31-50 % fractional precipitate...	21	.4	Died, hog cholera, 15 days
19	70	51-70 % fractional precipitate...	42	.6	Died, hog cholera, 24 days
20	61	51-70 % fractional precipitate...	49	.8	Died, hog cholera, 18 days
21	45	51-70 % fractional precipitate...	45	1.0	Died, hog cholera, 20 days
22	90	Controls received virus only...	C	C	Died, hog cholera, 13 days
23	84	Controls received virus only...	C	C	Died, hog cholera, 13 days
24	43	Controls received virus only...	C	C	Died, hog cholera, 15 days
25	35	Controls received virus only...	C	C	Died, hog cholera, 19 days

All hogs received 2 mils. of standard hog cholera virus.

*Prepared from mechanically defibrinated blood by addition of 1 per cent navy bean extract and 1 per cent sodium chloride, followed by centrifugation. Actual serum recovered, 77 per cent, by volume, of defibrinated blood; 10 per cent of a 5 per cent solution of phenol added as a preservative.

†In case of groups receiving fractional precipitates, dose and rate per pound are based on amount of original clear serum from which fractional precipitate was derived.

These and similar results seemed to indicate quite clearly that the 0-30 and 31-50 fractions possessed great protective powers against hog cholera virus (though by no means all of the antibodies were contained in either of them), but that the 51-70 fraction was nearly, but not quite, inert; and that by a single precipitation by saturation up to 55 per cent ammonium sulphate practically all the antibodies in the serum could be recovered—a deduction which appeared to be borne out by later work.

In all, five lots of potent serum were submitted to a single 55 per cent precipitation and the precipitates tested for potency. The table below is a fair example of the results obtained by such potency tests, which were remarkably uniform.

TABLE No. 2.

Showing Results of Simultaneous Potency Tests on Original Clear Serum and Two Single 55 per cent Precipitates, Nos. 10 and 11, Derived from It.

Hog No.	Wt.	Material Injected	Dose in Mils.	Rate per lb. in Mils.	RESULT
1	84	Original clear serum*	34	.4	Lived
2	65	Original clear serum	26	.4	Lived
3	80	Original clear serum	24	.3	Lived
4	62	Original clear serum	19	.3	Lived
5	74	Original clear serum	16	.2	Lived
6	59	Original clear serum	12	.2	Lived
7	71	Original clear serum	8	.1	Lived
8	56	Original clear serum	6	.1	Lived
9	81	Single 55% precipitate, Lot 10.	32†	.4†	Lived
10	63	Single 55% precipitate, Lot 10.	26	.4	Lived
11	75	Single 55% precipitate, Lot 10.	24	.3	Lived
12	61	Single 55% precipitate, Lot 10.	18	.3	Lived
13	71	Single 55% precipitate, Lot 10.	14	.2	Lived
14	56	Single 55% precipitate, Lot 10.	12	.2	Lived
15	67	Single 55% precipitate, Lot 10.	8	.1	Lived
16	53	Single 55% precipitate, Lot 10.	6	.1	Lived
17	82	Single 55% precipitate, Lot 11.	32	.4	Lived
18	64	Single 55% precipitate, Lot 11.	26	.4	Lived
19	80	Single 55% precipitate, Lot 11.	24	.3	Lived
20	62	Single 55% precipitate, Lot 11.	18	.3	Lived
21	73	Single 55% precipitate, Lot 11.	14	.2	Lived
22	57	Single 55% precipitate, Lot 11.	12	.2	Lived
23	68	Single 55% precipitate, Lot 11.	8	.1	Lived
24	54	Single 55% precipitate, Lot 11.	6	.1	Lived
25	36	Controls received virus only . . .	C	C	Died, hog cholera, 24 days
26	39	Controls received virus only . . .	C	C	Died, hog cholera, 19 days
27	47	Controls received virus only . . .	C	C	Died, hog cholera, 11 days
28	92	Controls received virus only . . .	C	C	Died, hog cholera, 11 days

All hogs received 2 mls. of standard hog cholera virus.

*Prepared from mechanically defibrinated blood by addition of 1 per cent navy bean extract and 1 per cent sodium chloride, followed by centrifugation. Actual serum recovered 72 per cent, by volume, of defibrinated blood; 10 per cent of a 5 per cent phenol solution was added as a preservative.

†In case of groups receiving precipitates, dose and rate per lb. are based upon amount of clear serum from which precipitate was derived.

In view of the fact that the doses in these tests still protected, although carried down very low, it seemed quite conclusively

proven that practically all the antibodies present in the original serum must have been recovered by the single precipitation.

REPRECIPITATION.

In one instance a mixture made up of twenty-one different precipitates of various percentage fractions and one lot of clear serum was made and the whole mixture precipitated by the addition of 55 per cent of ammonium sulphate. The resulting precipitate was then brought into solution and tested for potency. As nearly as could be calculated in the case of such a complicated mixture, the final product contained nearly all the protective properties present in the serum from which the various portions of the mixture were originally derived. It is interesting to note, however, that this reprecipitation and solution did not appear to make the final product any more readily filterable. The general difficulties in connection with this problem will be discussed later.

DIALYSIS OF PRECIPITATES.

No extensive work was done along the lines of dialysis of precipitates, market conditions being such that the obtaining of a supply of suitable paper was apparently impossible at the time this work was being carried on. Enough work was done, however, to indicate that these precipitates could be rendered ammonium sulphate-free by dialysis without material loss of antibodies.

It was also found by experience that solutions made up from precipitates from which the free fluid had been removed by pressure between absorbent pads did not contain enough ammonium sulphate or sodium chloride to produce any local or general disturbance when administered to swine subcutaneously or intramuscularly; so that no material advantage was to be gained by dialysis.

CONCENTRATION AND FILTERABILITY OF FINISHED PRODUCT.

The two outstanding advantages which might be obtained by a process such as we have discussed would apparently be a concentrated product admitting of small dosage and complete sterilization and clarification. Our experiments, however, did not yield much encouragement as to the possibility of a combination of these two features.

Great concentration of finished product as compared to the original serum is perfectly feasible. The precipitates obtained

by a single precipitation with 55 per cent of ammonium sulphate can be readily brought into what appears to be complete solution in normal saline solution or distilled water, so that the solution is only one fourth the volume of the original serum.

Once passed through a bacteria-retaining filter, the final product is a beautiful, clear, palely opalescent fluid, with no marked tendency to deteriorate by clouding or precipitation during storage, and apparently fully potent. However, the large mass of precipitate resulting from the addition of the 55 per cent of ammonium sulphate required to insure the gathering of all the antibodies in a single precipitation, even when dissolved in a volume of water or normal saline solution equal to the original serum, produces an extremely viscid, opaque, gray liquid. Even after centrifugation or several passages through paper or asbestos filters, the passage of this liquid through a bacteria-retaining filter candle was not possible in practical amounts, the filter-choking substance evidently being in true solution or so finely suspended as not to be removable by such preliminary treatment.

No attempt at chemical clarification of the final solutions before filtration was made, and there may still be possibilities along this line, or perhaps some modification or refinement of the precipitation method might overcome the difficulties of final filtration.

Reichel's³ report, in fact, indicates that with the somewhat more elaborate methods of precipitation used by him, passage of the finished product through bacteria-retaining filters presented no great difficulty.

An interesting circumstance was noted in connection with the practical failure of the final filtrations—namely, that cultural tests showed many of the solutions to be sterile in spite of the fact that no precautions in excess of what might be considered ordinary household cleanliness had been taken at any time during the process against contamination, a final filtration having been counted on for sterilization. This indicated that the final precipitate solutions with the usual preservative added had marked bactericidal powers tending to self-sterilization. Such solutions, however, when actually planted with a culture of *B. subtilis* rich in spores yielding a luxuriant growth after six months, even though phenol was present in excess of 1 per cent, thus showing that self-sterilization of these solutions could not

be relied upon in actual practice where they were exposed to general contamination.

THE UTILIZATION OF DEFECTIVE SERUM.

In certain circumstances the use of the simple method described—namely, a single precipitation with 55 per cent of ammonium sulphate and the solution of the resulting precipitate—might be of value in utilizing defective anti-hog cholera serum. The great reduction in bulk possible by this method might permit of the utilization of antiserum of low potency but in good physical condition, though the expense involved for chemicals and labor would probably be as great as that for the production of an equal number of protective units in additional lots of serum.

The persistent production, however, of serum of low potency in spite of every effort to the contrary is not now a factor encountered in the production of anti-hog cholera serum, as it still is in the case of some other antisera where the horse is used as the producing animal, especially with antigens not actually pathogenic for equines in the true sense of the word.

We made one unsuccessful effort to salvage a lot of ordinary defibrinated whole blood hog cholera serum which was highly potent at the time of production, but on removal from cold storage four months later was found spoiled, some stock bottles being badly decomposed and others solidly coagulated. The trouble had arisen from insufficient agitation at the time the preservative was added to the whole lot in bulk before placing in stock bottles.

This solid and liquid material was emulsified, strained, the solid residue leached with water and again strained, and this process repeated several times until nearly the whole was brought into a bulky, watery solution which was precipitated by the addition of 55 per cent of ammonium sulphate, a precipitate of satisfactory bulk and consistency being obtained. This precipitate, however, when tested for potency against hog cholera virus showed very little protective value compared to that present in the original serum represented. It is presumed that the antibodies were either destroyed by decomposition or so entangled in the solid residues as not to be removed by the leaching process, or both.

PRACTICAL VALUE OF THE PROCESS.

There would seem to be several very good reasons why anti-hog cholera globulins prepared along the general lines described

in this paper are of little practical value for actual use in the control of hog cholera. These reasons will be briefly mentioned.

Owing to the generally low unit value of swine, any product used to protect them against hog cholera must be relatively inexpensive; and while no attempt has been made to keep detailed cost records during this work it is obvious that the outlay for chemicals, apparatus, fuel and labor needed to carry out a process of this sort is quite heavy.

An actual demand for such a refined product probably does not exist, as the simple, clear anti-hog cholera serum which would be the raw material used in this process is itself an almost perfect agent of its kind. The relatively large dose used is no real drawback, owing to the fact that it is derived from and used entirely upon swine and is therefore a strictly homologous serum not capable of producing any objectionable phenomena such as anaphylactic shock, serum sickness, etc. At the present time clear, sterile anti-hog cholera serum is being produced commercially and sold at a price little, if any, in excess of that charged for the old type of defibrinated blood hog cholera serum and appears to be successfully meeting all requirements for the economical control of hog cholera; so that no increase in the cost of such work is warranted.

CONCLUSIONS.

1. The recovery of practically the entire antibody content of anti-hog cholera serum in a single precipitation by the addition of 55 per cent of ammonium sulphate is apparently uniformly accomplished.

2. The subsequent final clarification and sterilization of such precipitates in solution by passage through a bacteria-retaining filter is exceedingly difficult and perhaps impracticable, though the anti-body content is not apparently lowered by such filtration when it is accomplished.

3. The commercial production of such a globulin product is probably not justified at this time owing to the high cost as compared to the very satisfactory sterile, clear anti-hog cholera serum now on the market at a reasonable price.

REFERENCES.

1. Journal of Infectious Diseases, Vol. 17, No. 2, Sept. 1915, p. 339.

2. Journal of Infectious Diseases, Vol. 19, No. 3, Sept. 1916, p. 432.
3. Report of the Eighteenth Annual Meeting, United States Live Stock Sanitary Association, p. 127.
4. Journal of Agricultural Research, Vol. 6, No. 9, May 29, 1916.
5. The Biochemic Journal, Vol. 10, No. 2, June 1916.

FEDERAL MEAT INSPECTION AS A SAFEGUARD TO PUBLIC HEALTH.*

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It is common knowledge that the Federal Government maintains, through the Bureau of Animal Industry of the United States Department of Agriculture, a system of meat inspection, but comparatively few persons are familiar with its scope or the manner in which it protects public health. The work is scientific and technical and gives consumers comfortable assurance that the inspected products they buy are healthful and wholesome. The inspection proceeds by logical steps, commencing with the careful ante-mortem examination of the animal, continuing with the inspection of the carcass while being dressed, the supervision of all meats, used for curing, pickling, smoking, cooking, or canning, and finally with the proper, honest labeling of all meat or meat products.

MORE THAN SEVENTY MILLION ANIMALS INSPECTED LAST YEAR.

The extent of the Federal meat inspection service is definitely shown by the number of cattle, sheep, goats and swine slaughtered under Federal inspection. For a number of years the totals have approached 60,000,000 annually, or nearly two-thirds of all such animals slaughtered for food in the United States in the same periods. Figures for the fiscal year ending June 30, 1919, show a remarkable increase over previous years. Altogether more than 70,000,000 animals were slaughtered under Federal inspection. This inspection included in round numbers: Cattle, 11,241,000; calves 3,674,000; sheep 11,268,000 goats 125,000;

* Presented at meeting of American Public Health Association, New Orleans, October 30, 1919.

and swine 44,398,000. The statement that so many animals were inspected means that all were examined while alive and that the organs and different parts of each animal were inspected at the time of slaughter to determine their fitness for food. However, this double inspection, complete and important as it is, is but the first of several steps in the Federal system. The subsequent handlings—processing, preparation, storage and labeling—are given supervision, and the meats are reinspected as often as may be necessary. The federal system has been aptly described as extending “from the hoof to the can” or “from the live stock pen to the finished meat or product in the labeled package ready for shipment to the consumer.”

WIDE RANGE IN INSPECTORS' DUTIES.

The scope and purpose of federal meat inspection are to place the federal mark of approval upon all meats and products which competent examination shows to be sound, healthful and fit for food, and to condemn and destroy those which are found to be dangerous, unsound or otherwise unfit for such use. The inspection also includes supervision of the establishments with respect to sanitation, construction, and suitable methods of handling all meat and their products. Furthermore, the consumer of meats is protected against the use of harmful dyes and chemicals, and against false or misleading names or statements on labels. In short, the meat inspection service seeks to protect the public health and the rights of consumers, and to do this without infringing upon the just rights of the producer, and without waste of the nation's meat-food supply.

Federal meat inspection is being maintained at 825 establishments in 230 cities. These figures undergo some increase or decrease from time to time, but they represent a reasonably permanent average. Stated in round numbers about 2,600 inspectors are regularly employed. Of this number about 800 are graduate veterinarians; the remainder are lay inspectors, who, through experience and training, acquire the technical knowledge and skill necessary to a proper performance of their duties. The appointing of inspectors is controlled by and is in accordance with the requirements of the United States Civil Service Commission.

Sometimes the question is asked why federal meat inspection is not made to cover every slaughter house and meat-preparing

plant in the United States instead of a limited number. The answer is that the Federal Meat Inspection Act is based on the commerce clause of the constitution, which restricts the application of federal inspection to establishments engaged in interstate or foreign trade and to meats and products which are to be sold or shipped as articles of interstate or foreign commerce. The inspection cannot be extended to those establishments which confine their sales and shipments to the state in which located. However, when federal inspection is inaugurated at an establishment it is maintained there in respect to the whole establishment and applies to all animals slaughtered, and to all products prepared therein. This is necessary to the completeness of the inspection and to a proper enforcement of the regulations. The result is that very great amounts of meats not shipped or sold in either interstate or foreign commerce, but consumed locally, are, nevertheless, inspected and bear the marks of federal inspection.

The inspection has been extended as far as contemplated and permitted by the law and as far as has been possible with the funds provided by Congress for its maintenance. If the entire meat food supply of the country is to be properly inspected, it will devolve upon the several states or municipalities to establish and maintain an adequate inspection to cover the field to which federal inspection cannot be extended. Many of our cities do maintain such an inspection.

The great need of an efficient meat inspection is shown by the number of animals and the quantities of meats and products which are condemned yearly on account of disease, unsoundness, or other condition of unfitness, and thereby excluded from the food supply. The complete figures for all classes of animals and the various reasons for condemnation involve considerable detail. However, a general statement regarding them should serve the present purpose. For instance, on the post-mortem inspection alone there was condemned in the fiscal year 1919 a total of 212,245 cattle, sheep, swine and goats; while organs and parts of carcasses condemned on account of localized disease run into the hundreds of thousands.

TUBERCULOSIS AND HOG CHOLERA CAUSE MOST CONDEMNATIONS.

Tuberculosis in cattle and tuberculosis and cholera in swine were responsible for more condemnations than all other diseases

and causes combined. In addition to the condemnations on the post-mortem inspection, it was necessary to condemn in that year a total of more than 17,000,000 pounds of meats and products on account of their having become tainted, rancid, unclean, or otherwise unwholesome in the course of shipment, processing, preparation, or storage. The condemnations aggregate an enormous amount of material; fortunately, however, it represents but a relatively small part of the total of animals and meats inspected. By some the condemnations might be regarded as evidence that disease prevails to an unusual degree in American live stock, or that on account of undue strictness the inspection is wasteful of potentially good food. Neither of these deductions is in accord with the facts. Disease is less prevalent in the live stock of the United States than in the various European countries. As regards the inspection it must be maintained in the interest of the public health with a due measure of strictness. Necessarily this entails loss, but such loss can not be called waste. Moreover, the basic rules and regulations by which condemnations on the post-mortem inspection are determined were prepared with great care by competent officials, and then were submitted to an independent committee, composed of scientists and hygienists of the highest reputation, for consideration, and received that committee's approval.

INSPECTION BEFORE SLAUGHTER.

The first examination is the ante-mortem inspection, or inspection of the animals prior to slaughter. They are scrutinized while at rest in the pens or as they are moved from the scales. If the condition of an animal is such as to cause the inspector to suspect that it is diseased or affected by any condition which will cause its condemnation in whole or in part on the post-mortem inspection, the animal is set apart and marked "U. S. Suspect" by means of a serially numbered metal tag affixed to the ear. Such animals are held for separate slaughter and for an especially careful post-mortem examination. The diseases and conditions for which animals are most frequently so tagged are cholera, actinomycosis, emaciation, advanced pregnancy, and severe or excessive injuries. Animals which show symptoms of rabies, tetanus, milk fever, railroad sickness, and hogs which manifestly are sick with cholera are condemned and their carcasses destroyed without admission to the slaughter room. Such animals are

marked by the inspector with a numbered metal tag bearing the legend "U. S. Condemned."

POST-MORTEM INSPECTION INCLUDES EXAMINATION OF ORGANS.

The post-mortem or slaughter inspection is the most important of the several inspection procedures because it affords greater opportunity to discover the existence of most diseases. This calls for careful examination throughout. Accordingly, the inspectors first examine those glands, organs or parts in which disease most frequently occurs. For instance, in both hogs and cattle certain of the lymph glands of the neck usually are the first to show evidence of tuberculosis; therefore, those glands in every animal are cut and carefully viewed. The cheek and heart muscles of cattle are the seats where the beef measles, which produces tape worm in man, first appears. Accordingly, these parts are sliced in every instance so that no cow or steer affected with measles shall escape. These particular procedures are cited simply to indicate the pains taken to make the post-mortem inspection a thorough one. All the organs, as well as the carcass, are covered by this examination. If, on the completion of this inspection, the meat is found to be sound and fit for food the carcass is passed, and marked "U. S. Inspected and Passed" with the official number of the establishment at which it was slaughtered. The brand used for thus marking the carcasses is circular with the above legend in abbreviated form, and is stamped with a purple ink on the principal parts of the carcass. The ink is absolutely harmless.

ALL CONDEMNED MEAT DESTROYED IN GOVERNMENT-SEALED TANKS.

If an animal is affected with disease or other objectionable condition, whether it be slight, extensive, local or general, the inspectors mark it with a serially numbered U. S. Retained tag. Carcasses and parts so marked are officially in the custody of the inspector and are transferred to what is designated the final inspection room or place, where all the facilities necessary for the thorough examination of such carcasses are provided. The final inspection and disposition of retained carcasses and parts is a very important duty; therefore, only those veterinary inspectors who are the most experienced in the work are assigned to its performance. If the final inspection shows the meat to be

unfit for food, the carcass and the parts are condemned and plainly marked "U. S. Condemned" by means of a large metal brand. All condemned meats and products remain in the custody of the inspectors and are destroyed under Bureau supervision by conversion into fertilizer and grease in government-sealed rendering tanks. If the condition for which the carcass is condemned is found to be local the affected parts are condemned and the remainder of the carcass is passed.

LABELS MUST BE APPROVED.

The products inspection, as it is termed, covers the inspection and reinspection of meats and products from the time of slaughter through the succeeding processes of preparation and storage, including supervision of all operations to insure the sanitary handling of all edible materials. This supervision also controls the addition of spices, curing agents and other ingredients to products. None but those permitted under the regulations may be added. In order to see that the regulations are strictly observed a system of frequently collecting samples without notification to the establishment for laboratory examination is maintained. The products inspection also includes supervision of the branding and labeling of meats and products. The use of labels bearing false or misleading names or statements is prohibited; in fact, only those labels which have first been submitted to the Bureau and approved by it, may be used. The contents of the package must conform to the statements on the label.

The sanitary requirements prescribed and enforced under the meat inspection regulations constitute a highly important part of the federal system. The Meat Inspection Act confers upon the Secretary of Agriculture authority to prescribe and enforce such regulations at all establishments at which inspection is maintained. The more important of these requirements are adequate and proper toilet and lavatory and dressing room accommodations, and also smooth and impervious surfaces for operating rooms and equipment. Other requirements include good light, adequate ventilation, modern plumbing, efficient drainage, complete separation of rooms in which edible products are prepared from those in which inedible materials are handled, and pure water with ample facilities for its distribution. The requirements enumerated indicate the character of the sanitary regulations. Their purpose is to insure strict cleanliness in the preparation and handling of meats and meat food products, and

for the maintenance of clean and wholesome conditions in and about the establishment. Since the present meat inspection act became effective the establishments in the United States at which federal meat inspection is maintained have expended in the aggregate many millions of dollars in order to conform to the standard set by the regulations. It has been money well spent. The difference between a modern, sanitary plant operating under inspection and the country type of slaughter house operating without inspection of any kind is too marked for description. It needs to be seen to be adequately and properly appreciated. The regulations governing sanitation were framed on progressive lines, so that they not only serve the present needs, but also provide for the attainment of still better standards for the future. When new plants are to be erected or old ones reconstructed it is aimed to have the best standards followed; accordingly, it is required that the plans and specifications for the same be submitted to the Bureau for examination and approval.

IMPORTANT FACTOR IN FOREIGN TRADE.

While federal meat inspection is primarily a service in hygiene and sanitation, it occupies, nevertheless, an important position in our trade economics, and is the agency through which a very important part of our export commerce has been maintained. Without its certificate of inspection, the export trade in meats and meat food products would be seriously impaired. The amount of beef, pork and mutton certified for export in the fiscal year 1918 exceeded a total of 2,500,000,000 pounds, while the certification for the fiscal year 1919 will approximate 3,400,000,000 pounds. The figures do not include the shipments made to the American expeditionary forces in France. Exports have been tremendously stimulated by the war. However, under normal conditions the United States imports as well as exports great quantities of meats. All the imported meats are subjected to an adequate inspection under the federal system.

An economic importance possessed by federal meat inspection, but to which only casual reference can be made at this time, is the relation of its post-mortem records to the locating of territories in which food animal diseases prevail to an unusual extent, and the eradication of which is to be attempted.

A further point in regard to the economic value of federal meat inspection is the moderate cost at which it is maintained. The first aim is to make the service efficiently fulfill the purpose

for which it is intended; the second, to administer it with due regard to economy. In computing unit cost of maintenance the federal system has the advantage of a very large volume of operations, and it will be gratifying to the tax-payer to learn that largely owing to this advantage the service is maintained at a cost of less than six cents for each animal inspected. This sum covers the expense of all the inspections from that of the live animal to the final examination of the finished products.

STUDY OF LOCAL INSPECTION.

Lately the Bureau has completed a survey of municipal and state meat inspection. About one-third of the meat consumed in the United States is slaughtered and sold within state boundaries and therefore is not subject to federal inspection. This is a condition which local authorities must handle. The results of the survey include some highly interesting facts and figures, and to make them available to members of the Association I have requested our Mr. Roberts to furnish the Association with a copy of the findings. You will learn that the majority of cities have no inspection of their meats. The reasons for the absence of local supervision in many cities include lack of funds and lack of sufficient interest. Apparently health considerations alone have failed to rouse cities to the importance of having local meat establishments inspected. It is not within my authority to say what should be done, but this much is certain, the inspection is needed as the facts show and as all who are familiar with average slaughter house conditions will quickly admit. Their interest in health alone fails to get results, possibly some additional fact may be found and used as means of obtaining and holding the necessary support.

Municipal and state meat inspection is a field where a great deal of constructive work remains to be done. It is paramount for health reasons and the health side appeals to many people. Yet the economic side may appeal to a great many more. This, briefly, is the thought I want to leave with you. Human welfare is the common cause we are serving. Methods of livelihood have produced what are commonly called "industrial classes" and also terms like "product," "consumer," and "distributor." Each group has its problems in which it is deeply interested and many of which are vital to human happiness. In attempting to carry certain lines of scientific work before the public we may

wisely study the aims of these groups, thus meeting with co-operation which may simplify many a knotty problem and hasten the successful solution of others.

STUDIES ON ANTHELMINTICS.

VI. TESTS OF THE ADMINISTRATION OF ANTHELMINTICS IN ENTERIC-COATED SOFT GELATINE (SOLUBLE ELASTIC) CAPSULES.

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Anthelmintics intended to remove worms from the small intestine must first pass the stomach, and we know that a certain amount of the anthelmintic is absorbed by the stomach, thereby adding to the systemic toxic effects, in addition to diminishing the amount of anthelmintic available against the worms in the small intestine. Furthermore, the anthelmintic undergoes dilution by the fluids and ingesta in the stomach, which dilution may reach a point where it will perceptibly diminish the efficacy of the drug and may render it entirely ineffective.

To avoid the above objectionable effects from the passage of anthelmintics through the stomach, it would appear to be the logical thing to enclose the drug in an enteric coat, so that the drug would be released in the intestine, thereby avoiding absorption and dilution in the stomach. In actual practice, enteric coats are not entirely satisfactory affairs. A number of substances which are comparatively insoluble in the acid gastric juice are used, such as talc-shellac, phenyl salicylate, keratin, and formalin-hardened gelatine, but there are objections of one sort and another to these. In our experience, talc-shellac coatings will open in the stomach at times or fail to open in the upper portion of the small intestine at times, and the formalin-hardened gelatine gets progressively harder with age and ultimately fails to open at all, passing the entire digestive tract.

Tests of soft capsules containing oil of chenopodium and coated with the talc-shellac preparation gave entirely satisfactory anthelmintic results. The dose used was that given by the writer (Hall, 1917) in a previous paper—5 minims for dogs weighing 10 pounds or less, 10 minims for dogs weighing 10 to 20 pounds,

* Resigned March 27, 1919.

15 minims to dogs weighing 20 to 30 pounds, and 20 minims to dogs weighing over 30 pounds. In one or two instances where dogs weighed close to the upper limit of the 10-pound range given here, the additional 5 minims of the range above was given. The tests are given in the following table:

Dog No.	Wt. Kilos.	Dose.	Worms passed.				Postmortem.				Ascaricidal efficacy, per cent.	
			Ascarids.	Hookworms.	Whipworms.	Tapeworms.	Day.	Ascarids.	Hookworms.	Whipworms.		Tapeworms.
65	14	20 v	2	0	0	0	4th	0	0	0	0	100
72	13	20 v*	5	0	0	0	6th	0	0	0	0	100
73	16	20	0	0	0	0	4th	0	0	10	0	...
74	6	10	3	0	0	0	4th	0	0	0	50	100
75	11	15	2	0	0	0	4th	0	0	0	8	100
76	7.5	10	3	0	0	0	4th	0	1	18	1	100
77	10	15	22	0	1	0	4th	0	0	22	76	100
78	12	15	6	0	0	0	4th	0	0	0	65	100
79	9	15 v	5	0	0	0	4th	0	0	0	22	100
80	7	10	6	0	0	0	4th	0	0	4	14	100
81	10	15	1	0	0	0	4th	0	0	0	0	100
82	10	15	108	4	0	0	4th	0	5	0	0	100
84	8	10	0	0	0	0	3rd	0	0	7	0	...
86	15	20 v	2	0	0	0	9th	0	0	0	0	100
91	7	10	4	0	0	0	6th	0	0	0	15	100
92	10	15	13	0	0	0	8th	0	0	1	1	100

v vomited capsules.

* received 45 mils castor oil.

There are 16 dogs in the above experiment. The weight is given in kilos (1 kilo = 2.2 pounds). The dose is given in minims, and in all cases was followed immediately by 30 mils of castor oil, except in the case of Dog No. 72, where it was preceded by 15 mils of castor oil and followed by 30 mils additional, 15 minutes after giving the capsules. The 4 dogs marked *v* vomited their capsules, opened, which indicates that these capsules may open in the stomach at times, though the moistened capsule may have opened in the dog's esophagus during vomition or may have been broken by the teeth at this time; the anthelmintic efficacy was not noticeably impaired by the opening of the capsules, apparently. The dogs averaged a little less than 10 kilos in weight; Hall and Wigdor (1918) have shown that 10 kilos is about the average weight for dogs. They received an average dose of a little less than 18 minims, or a little more than 1 mil, which is close to the therapeutic dose of 0.1 mil per kilo which the writer (Hall, 1917) has established experimentally. Two dogs were not infested with ascarids, which is taken by the

writer as the test worm for this anthelmintic. The 14 infested dogs had a total of 182 ascarids, all of which were removed, giving an efficacy of 100 percent. Of a total of 10 hookworms, 4 were removed, or 40 percent. Of a total of 63 whipworms, only 1 was removed, a total of less than 2 percent. Of 252 tapeworms, none were removed, an efficacy of 0 percent.

A series of tests were made with soft capsules containing 5 minims of oil of chenopodium and 10 minims of chloroform each, these capsules being treated to form an enteric coat of the gelatine by leaving them in 1 percent formaldehyde for a half minute to a minute and then allowing at least two weeks to elapse before using. The capsules used were given their enteric coating by Wilbur L. Scoville and were less than a month old when used. After a year to a year and a half, according to Scoville, such capsules become so insoluble that they pass the digestive tract unopened.

In our series of tests we were unfortunate in being unable to obtain enough dogs infested with ascarids or hookworms to give the best sort of test, only 3 dogs out of 14 having ascarids and only one having hookworms. The tests were as follows:

Dog No.	Wt. Kilos.	Dose.	Worms passed.				Postmortem.					Ascaricidal efficacy, per cent.
			Ascarids.	Hookworms.	Whipworms.	Tapeworms.	Day.	Ascarids.	Hookworms.	Whipworms.	Tapeworms.	
98	10	3v	0	0	0	0	4th	0	0	1	371	...
93	8	2	0	0	4	0	11th	0	2	7	0	...
94	10	3	0	0	0	0	11th	0	0	125	0	...
99	8.5	2v	0	0	0	2	4th	0	0	2	0	...
100	11.5	3v*	0	0	0	0	5th	0	0	0	27	...
101	9	3v*	0	0	0	0	5th	0	0	0	0	...
102	7	2v*	0	0	4	0	5th	0	0	0	0	...
103	7	2	0	0	0	0	5th	0	0	0	0	...
104	11	3	4	0	0	0	5th	0	0	0	9	100
106	9.5	3v	0	0	0	0	12th	8	0	0	1	0
107	19.5	3	0	0	0	0	14th	0	0	0	10	...
109	8	2v	7	0	0	0	14th	5†	0	0	0	†58
112	9.25	3v	0	0	0	0	5th	0	0	0	56	...
113	8	2v	0	0	0	0	5th	0	0	0	0	...

v vomited after treatment. * given more than 30 mils castor oil with treatment. † ascarids in stomach.

The weight is given here in kilos. The dose is given in number of capsules, each capsule containing 5 minims of oil of chenopodium and 10 minims of chloroform, as noted above. The

capsules were followed immediately with 30 mls of castor oil, except in the cases noted above, where larger doses were given. Eight of the 14 dogs vomited after treatment, bringing up the capsule in some cases. In one of these cases, Dog 106, where vomiting occurred, though no capsules were found in the vomitus, the treatment was an entire failure against ascarids. These dogs averaged a little less than 10 kilos in weight and received on an average about 13 minims of oil of chenopodium and 26 minims of chloroform. There were ascarids present in 3 dogs: The treatment removed all of these in one case, none of them in another case, where vomition occurred, and 58 percent in another case (Dog 109). In this last case, the dog had 1 ascarid in the small intestine and 4 in the stomach. This develops one objection to the use of enteric-coated preparations for use against ascarids. These worms are notorious for their wandering habits, and the stomach is a favored site for wandering, especially in puppies. Obviously an enteric preparation that passes the stomach unopened will fail to remove ascarids located in the stomach.

While there is something fascinating about the idea of exploding an anthelmintic bombshell in the midst of the worms in the small intestine, there are certain difficulties in the way of a practical application. For one thing, the shell may pass by a number of worms in the duodenum and upper jejunum before exploding, and it is impossible to time the shells for various ranges and bracket the initial shots. It seems likely that the capsule would shove before it such worms as ascarids, especially in masses, until it broke, but it would easily slip by such worms as hookworms or even small ascarids. The treatment failed to remove the 2 hookworms present. It removed 8 of 143 whipworms, a little over 5 percent, and removed 2 of 476 tapeworms, or less than 1 percent.

The results obtained by the use of formalin-gelatine enteric coats, enclosing a mixture of oil of chenopodium and chloroform, are not satisfactory. On the other hand, the results obtained by the use of the talc-shellac coat are unusually good, the minimum therapeutic dose removing all the ascarids present from 14 infested dogs. Whether this efficacy is to be attributed in any part to the anthelmintic coat is debatable.

Just how uncertain is the action of an enteric coat, may be judged from the following experiments:

Dog No. 332, a mongrel weighing 14 kilos, was given three 10-minim soluble elastic gelatine capsules of oil of chenopodium, enteric coated with the talc-shellac preparation, the capsules being followed immediately with 30 mils of castor oil. Two hours and 5 minutes later the dog was shot and 4 minutes thereafter the stomach was opened. The three capsules were found in the stomach unopened; the castor oil had apparently gone on through the small intestine.

Dog No. 334, a wolfhound mongrel weighing 14.5 kilos, was given three similar capsules and the same amount of castor oil. Three hours later the dog was shot and the stomach opened. Two capsules were found in the stomach; the enteric coats were cracked, but the capsules were not opened. One capsule was found in the lower jejunum, similarly with a cracked enteric coat, but unopened. The castor oil was in the cecum and the large intestine.

It appears from the above that enteric-coated capsules may lie in the stomach for long periods, while the accompanying purgative passes out; that the enteric coats may break partly by digesting and partly, perhaps, from mere moistening, softening, and the mechanical effects of peristalsis; that the capsules may pass as far as the lower jejunum, and perhaps to the large intestine without opening; and that of the same lot of capsules, simultaneously administered, some may do one thing and some another. With talc-shellac coats, the ascaricidal efficacy is unimpaired, while no conclusions can be safely drawn from the showing of 40 percent efficacy against hookworms.

Zeigler (1917) has also investigated the possibilities of enteric-coated capsules of oil of chenopodium, from a physiological standpoint and without reference to their anthelmintic value. He used hard capsules, filled with a hypodermatic syringe and coated with salol by dipping in melted salol, drying, and repeating the process until a sufficiently thick coat had formed. He notes that as ordinarily given, dogs will show symptoms of chenopodium absorption within 10 minutes, and that with the enteric coats, symptoms—and presumably absorption—were delayed from 30 minutes to an hour and a half. Of 10 animals given twice the minimum lethal dose (the m. l. d. is 0.5 m. p. k.), only 2 died; some only showed vomiting and salivation. Two animals were given this dose and chloroformed at the end of 2 hours. The capsules had dissolved and evidence of their solution was found in the intestine.

It will be noted that Zeigler's findings differ from those given in this paper. He finds enteric capsules dissolved in 2 hours; we found them still in the stomach in 2 hours, and in the stomach and in the ileum in 3 hours. Of course, the explanation for this may lie in the fact that he used a salol coat on a hard capsule, and we used a talc-shellac coat on a soft capsule.

Zeigler states that "The animals were placed in metabolism cages and watched carefully to see that none of the capsules were vomited or passed in the stools." It is to be regretted that all the dogs in his experiments were not killed and examined post-mortem. It would be interesting to learn why double the m. l. d. of this drug failed to kill or even produce marked symptoms in these dogs. Apparently it is due to the slight absorption of the drug in the intestine, but if this is the case, why did 2 of the dogs die? Did the capsules, perhaps, open in the stomach in these 2 cases? In this connection, Zeigler says: "The absorption is more rapid from the stomach than from the intestines." On the other hand, Salant and Livingston (1915) found that several hours may elapse before evidence of absorption into the circulation could be obtained when the oil was introduced into the stomach of animals, in which the pylorus had been previously ligated, whereas absorption from the duodenum was very rapid. In our own experience, we find that there is considerable variation in the case of individual dogs, but certainly there is a very rapid gastric absorption in most cases, the onset of symptoms following the administration of the drug very promptly. On the other hand, some dogs show little evidence of the presence of the drug at any time. Doubtless the conditions which have been mentioned by Salant and his collaborators enter into these cases—presence of hunger peristalsis, amount of fasting, etc. In our experience, the simultaneous administration of olive oil prolongs the period in which the castor oil remains in the stomach and increases the gastric absorption and production of gastric lesions.

Regardless of the fact in this case, and both findings might be right for the animals experimented on, the writer believes that less is to be expected from enteric-coated capsules which will allow of chenopodium absorption only in the intestines than from the use of such purgatives as castor oil, which will distribute the absorption, and the ensuing shock and insult to the mucosa, over as wide a surface as possible and simultaneously prolong the period of absorption and allow the patient a longer period in

which to dispose of the toxic elements absorbed. Zeigler concludes: "Just what effect this delayed absorption of the oil when administered in enteric capsules would have upon its vermicide effect I am unable to say at this time, but certainly I believe that the most rational method of administering the drug in hookworm disease would be in this manner." The writer cannot regard this entirely reasonable theory as sufficiently established by the available facts. The anthelmintic efficacy with the talc-shellac coats was well maintained, so far as ascarids are concerned, but even these capsules went at times to the ileum without opening, and the efficacy of the formol-hardened capsules was impaired. From the available facts, the writer is of the opinion that enteric coats add to the uncertainties of the action of anthelmintics, though more facts would be welcome.

REFERENCES.

- Hall, Maurice C. 1917. Anthelmintic treatment for nematode infestation in dogs. *J. Amer. Vet. M. Asso.*, n. s., v. 5 (3), Dec., pp. 342-345.
- Hall, Maurice C., and Meyer Wigdor. 1918. Gastro-intestinal lavage in dogs; its value in removing worms and in other respects. *J. Amer. Vet. M. Asso.*, n. s., v. 5 (4), Jan., pp. 443-456.
- Salant, William; and Livingston, A. E. 1915. Absorption and elimination of chenopodium. *Proc. Soc. Exp. Biol.*, v. 12 (6), pp. 130.
- Zeigler, W. H. 1917. A study of oil of chenopodium. *Interstate M. J.*, v. 24 (10), 13 pp., fig. 5.

Every one was pleased to welcome Dr. Mark Francis, of Texas, at the annual meeting after so long an absence.

All sections of the country, as well as parts of Canada, appeared to be represented at the New Orleans convention.

Dr. E. I. Smith, Chief Inspector, B. A. I., Baton Rouge, La., was recently called suddenly to his home in New York State on account of the unexpected death of his mother, an estimable lady of over eighty years of age. *THE JOURNAL* desires to extend to Doctor Smith and the other members of the family its sympathy and condolence in their bereavement.

CLINICAL AND CASE REPORTS.

NOTE ON A TOXIN-ANTITOXIN METHOD OF DIAGNOSIS FOR ULCERATIVE LYMPHANGITIS (BAC. PREISZ-NOCARD).

E. A. WATSON,
Department of Agriculture, Canada.

Nicolle, Loiseau and Forgeot have noted the antitoxic power of the serum of horses affected with ulcerative lymphangitis (Bac. Preisz-Nocard). Forgeot and Cesari showed that this specific property could be demonstrated and applied as a means of diagnosis (*Annales de l'Inst. Pasteur*, V. xxvi, 1912), in that a dose of serum from an infected horse would protect a guinea-pig against a lethal dose of killed toxic Preisz-Nocard bacilli—the bacilli being treated by alcohol and ether and dried *in vacuo* over sulphuric acid.

In numerous experiments that I have made in a study of the toxic properties of Preisz-Nocard bacilli I have always found that bacilli treated as above, or if killed by heat or by chemical solutions, lose their toxicity in great measure and are rendered more or less atoxic and harmless for test animals. As a diagnostic agent such preparations had little or no value in my experience. Further experiments showed that the soluble toxin obtained in the filtrate of unheated, highly virulent bouillon-cultures was fatal to guinea-pigs in very small doses and much better suited for a diagnostic test.

Briefly, my method is based on the neutralization of a lethal dose of this soluble toxin by the addition of antitoxic serum. A suitable toxin should have a minimum lethal dose of 1.0 c. c. or less, killing a guinea-pig of average weight and size in 24-36 hours. The same amount of antitoxic serum, or even less, will neutralize the dose of toxin. One must prepare in advance the toxin and determine the required lethal dose. For the diagnostic test this dose of toxin is mixed with an equal quantity of serum of the suspected animal, given 20-30 minutes contact, and then injected subcutaneously or intramuscularly into a guinea-pig. The control is given the lethal dose of toxin alone, and will die within 24-36 hours. The test guinea-pig survives and is apparently none the worse for the experience, that is, if the serum

origin is a horse carrying the disease. On the other hand, if the serum origin is a normal horse or a diseased animal in which Preisz-Nocard infection does not exist, the test guinea-pig succumbs to the toxin in approximately the same time as the control.

The following is a demonstration test just recently made:

The suspected animal was an army horse detained under quarantine before admission to Canada after service overseas. No history of the animal having suffered from the disease was obtainable. During the period of detention at the port of entry the animal had been treated for a purulent sore in the region of the fetlock of the hind leg. At this inspection this old sore had healed and cicatricised, but another ulcer had broken out a few inches above the old one, and had, a day or two previously, so it was said, discharged blood and pus.

For demonstration purposes, 6 guinea-pigs were used: Numbers 1, 2 and 3—the controls—were given injections of toxin in doses of 0.5 c. c., 1.0 c. c., and 2.5 c. c., respectively. Numbers 4, 5 and 6—the test animals—received a mixture of equal parts of toxin and the suspected horse serum (20 minutes contact) in double the amount given above, so that each test animal received the same amount of toxin as the control.

The three controls died in from 24-36 hours after injection. The three test animals survived, apparently unaffected by the injections, thus demonstrating with certainty that the suspected horse serum had specific antitoxic and neutralizing action on Preisz-Nocard toxin.

Diseases originating with the Preisz-Nocard bacilli, and differing widely in clinical aspects, occur in different species of animals. In the horse the disease may occur in the form of ulcerative lymphangitis of one or more limbs, or as a large pus cavity situated anywhere in the body, in the muscles, or under the skin; also, and not infrequently, as renal abscesses while no outward signs of infection are present. The disease is essentially of a rebellious and recurring character. In the intermittent or sleeping stages and in those forms of infection in which clinical symptoms are absent, the toxin-antitoxin test method permits an accurate diagnosis.

ACKNOWLEDGMENT.

The demonstration test noted above was made at the Research Station, Ottawa, by kind permission of Dr. F. Torrance, Veterinary Director General, and of Dr. S. Hadwen, pathologist.

AN OUTBREAK OF BLACK LEG IN SHEEP

HADLEIGH MARSH,

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Although blackleg is recorded in the literature as occurring in sheep, veterinarians and stockmen generally consider that sheep are not susceptible to this disease. It may be that, due to this fact, a diagnosis of blackleg is not made in some cases where sheep have been lost from this cause. However this may be, the diagnosis of blackleg in sheep is so seldom made, that the history of an undoubted outbreak should be of interest to veterinarians.

In this instance, the disease occurred in a bunch of 270 yearling Rambouillet bucks. The original diagnosis was made by Dr. N. T. Gunn, of Butte, and Dr. H. L. Jones, of Drummond, Montana. They forwarded tissues to the laboratory, and the diagnosis was confirmed. Vaccination was advised, and all the sheep were vaccinated with blackleg aggressin in 2 c. c. doses. This apparently checked the disease, but a month later there was a recurrence. At this time an investigation was made from the laboratory, and again the diagnosis of blackleg was confirmed by careful laboratory experiments.

The detailed history of this outbreak is of interest as indicating the conditions under which animals become susceptible, and the possible means of spreading the infection. The sheep were being run on a timothy and clover meadow during the month of August. This field had no history of blackleg for a number of years, either in cattle or sheep. About the last week in August, a ewe got into the pasture with the bucks, which caused severe fighting among the bucks for several days. About ten of the sheep died at this time, and the owner thought at first that they were killing each other, as all those that died were badly bruised. The deaths continued, and by August 30th eighteen had died. On this date Dr. Gunn and Dr. Jones made a post mortem examination of a sheep that had died within a few hours, and found typical blackleg lesions.

A specimen of the affected muscle was sent to the laboratory. Smears of this material showed organisms with the characteristic morphology of the bacillus of blackleg. A guinea pig was inoculated with some of the tissue, and developed typical blackleg lesions, in which the bacillus was demonstrated.

On Sept. 5th all the sheep were vaccinated with blackleg aggressin, using 2 c. c. doses. Four more died after vaccination,

and then the losses ceased. At the same time the sheep were turned into another pasture. The owner allowed the carcasses to lie in the field, without being buried or burned. Some time later the sheep were moved back into the field where the losses first occurred, and the owner irrigated the field.

On October 6th, one month after vaccination, four deaths were reported, and on October 8th three more died. At this time an investigation was made from the laboratory. A post mortem examination was made on one sheep. No lesions were found in the internal organs. The muscles of the face, jaws, neck and breast showed edema and hemorrhages. The muscles were dark red, and contained some gas. When the affected muscles were cut, the characteristic odor of blackleg was noticed. Muscle tissue from this sheep, and a specimen of soil and grass from the field where the loss occurred, were brought to the laboratory.

A small piece of the soil was inoculated under the skin of a guinea pig, without any visible effect.

Smears from the specimen of muscle showed the presence of the bacillus of blackleg. A guinea pig was inoculated with this material. After twenty-four hours, this pig showed no apparent systemic reaction, but there was a marked edema of the leg into which the inoculation was made. As an early diagnosis was desired, the guinea pig was killed and post mortem examination made. Smears from the bloody exudate showed the presence of the blackleg bacillus. Another guinea pig and a rabbit were immediately inoculated with this exudate.

The second guinea pig died in less than twenty-four hours with typical lesions of blackleg. The organism was recovered in anaerobic cultures. The rabbit, on the other hand, developed only a slight swelling in the inoculated leg, from which he soon recovered. This fact helped to confirm the diagnosis, as rabbits are considered to be relatively immune to blackleg.

In order to complete the evidence in this case, a sheep was inoculated with some of the affected muscle which had been taken from the sheep which had been autopsied at the ranch. This sheep died in about twenty-five hours, and post mortem examination was made after he had been dead over night. At the time of post mortem examination, the blackleg bacilli had invaded all the internal organs, and the muscles and subcutaneous tissue showed the characteristic changes over the whole body. Typical blackleg bacilli were identified in smears from the muscle,

heart blood, pericardial fluid and kidney. The organism was recovered in pure culture from the various organs.

Especial pains were taken in this case to confirm the diagnosis, which was definitely blackleg. The history shows that the blackleg infection must have been present in the meadow where the sheep were run, although the owner knew of no previous outbreak of blackleg at this place. This indicates that the organism is very generally distributed, and may cause disease at any place when the proper conditions exist. In this instance, the bucks were made unusually susceptible by their severely bruised condition due to fighting. At the same time the field was irrigated after a dry season which probably made the blackleg spores more available, and may have caused germination of spores.

The vaccination with the aggrassin prepared for use with cattle, apparently checked the original outbreak, as Dr. Jones reported that four sheep died within a few days after vaccination, and then there was no more loss until a month later. When all the conditions are considered, the second outbreak need not throw doubt on the immunizing value of the vaccine. Due to the fact that the owner, in violation of state regulations and contrary to the instructions of the attending veterinarian, allowed more than twenty carcasses of sheep dead of blackleg to remain unburied, and then irrigated the field, an enormous number of virulent spores were probably spread over a considerable area. The result was, in my opinion, that the sheep were subjected to such an overwhelming infection that their immunity was broken down in some cases.

Dr. J. F. Winchester, of Lawrence, Mass., attended, by invitation, a meeting at Worcester, October 25, held under the auspices of the Cattle Commissioners, at which he was called upon to answer questions relative to the inspection of cattle and experiments made in the use of tuberculin.

Dr. N. S. Mayo, Secretary of the A. V. M. A., has accepted an invitation to attend the California Veterinary Medical Association's Short Course for Veterinarians to be held at the University Farm on December 29, 30, and 31, and to assist in the program. The Southern California Auxiliary will hold their meeting at Los Angeles on January 2 and 3. The same speakers will go from University Farm to assist in the meeting at Los Angeles.

ABSTRACTS.

ALYPIN IN THE NERVOUS FORM OF DISTEMPER.

Jakob, in the *Tijdschrift voor Veeartsenijkunde*, reports the following observations: He has repeatedly used intra-lumbar injections of Alypin in the nervous form of distemper. He performs the injection between the last lumbar vertebra and the sacrum, and has also given some subcutaneous injections. He concludes that when myelitis and encephalitis appear in the course of distemper, with symptoms of paralysis and rhythmic and clonic contractions, lumbar injections of Alypin produce favorable but transient effects. He also finds that the dog supports high doses of this drug. Symptoms of intoxication do not appear even after the injection of five centigrammes of Alypin to the kilogramme of live weight.—*Annales de Méd. Vét.*

THE ACTION OF SOME DRUGS UPON THE PULMONARY VESSELS.

Bereoine published the following observations in the *Rousski Vrach* of 1914: Adrenalin, in concentrations which produce a very strong constriction in the peripheral vessels, manifests no action on the pulmonary vessels; and even vaso-dilation is frequently observed. Nicotine, pilocarpine, and barium chloride produce vaso-constriction in the pulmonary vessels. Caffeine produces first pulmonary vaso-constriction, and afterwards, rapidly and constantly, a consecutive vaso-dilation.

Atropine has no appreciable influence upon the pulmonary vessels; but, if these were previously contracted (under the influence of pilocarpine, for example) atropine causes the contraction to disappear. (*Revista de Hygiene y Sanidad Veterinaria*).—W. R. C. (*Vet. Rec.*)

POLYNEURITIS OF FOWLS.

C. SANZ EGANA,
Revista Vet. Espana. Vol. XII, No. 6, June, 1918, pp. 241-247.

The author has encountered in Malaga a polyneuritis in fowls which he regards as due to "deficiency" or avitaminosis.

The flock in which the disease appeared was kept exclusively for the purpose of consuming injurious insects, and had to live almost entirely on what food the ground provided. Occasionally a feed of seeds of sweet sorghum was furnished to them in special circumstances, but this was seldom.

The disease presented itself generally in a chronic form, and the first symptoms which indicated illness were pains in the legs and difficulty in walking. The gait was vacillating, with inco-ordination of movements. Little by little the paresis increased, the feathers were held erect, and the wings became involved and pendulous. Paralysis of the neck was accompanied by rigidity and contractures simulating those of tetanus, and there were manifestations reminiscent of those exhibited by a pigeon from which the cerebellum has been removed. Dysphagia accompanied paralysis of the neck. Respiratory symptoms (acceleration, dyspnœa) and general emaciation were very marked. General sensibility diminished greatly. In most instances the disease lasted from fifteen to forty days, but there were more acute cases in which death ensued in from five to eight days.—*Vet. Rev.*

TRACHEOSTOMY.

F. CINOTTI,

La Clínica Vet. Vol. XLI, No. 18. 30th September, 1918, pp. 457-462.

Arguing from analogy, the author suggests that the term *tracheostomy* should be employed to designate the operation by which a permanent opening is made into the trachea. He recommends that the operation should be performed in the following manner: The horse should be cast, and, preferably, placed on his back, with the head and neck fixed in an accurately extended position relative to the body. The seat of election is in the upper fourth of the neck.

The skin is shaved and a local anæsthetic applied. An oval piece of skin is incised, the long axis of the oval being about 6 cm. in length and corresponding to the long axis of the neck. The shorter transverse diameter should be about 3 cm. The segment of skin thus circumscribed is removed.

The musculature of the neck having been exposed, an oval segment of the muscles, equal in extent to the piece of skin already removed, is excised with curved scissors. This is facilitated by first dissecting the muscles in the middle line of the

neck. During the removal of the muscles it is imperative that the head and neck be held in exactly the correct position, otherwise there is the possibility that an unsightly deformity may be produced. The perichondrium over each of three or four tracheal rings is cut through, and segments of the cartilages shelled out of their perichondrial covering. That is to say, the internal perichondrium is left intact, so as to avoid injury to the mucous membrane. It follows that the segment of each tracheal cartilage must be removed separately. The mucous membrane is now incised in the middle line, and accurately stitched to the margin of the skin, care being taken that the sutures do not cut the mucosa.—*Vet. Rev.*

INFECTIOUS ABORTION IN CATTLE.

Since Bang's discovery of a characteristic micro-organism associated with so-called "contagious abortion" in cattle, it has become customary to attribute the disease to *Bacillus abortus* described by him. The assumption that this is the sole or even the predominant etiologic agent concerned with a malady that occasions enormous economic losses has diverted attention away from the microbial cause and toward prevention or cure. Aside from the indirect interest that bovine disease represents in relation to human welfare, and particularly when the milk supply is involved, the bacillus of contagious abortion in cattle has lately been discussed as a possible agent of more direct menace in childhood.

The newer studies at the Department of Animal Pathology of the Rockefeller Institute for Medical Research, Princeton, N. J., under the leadership of Theobald Smith,¹ bring unexpected evidence that contagious abortion may involve something more than Bang's bacillus. They include the discovery of a spirillum of definite morphologic and cultural characteristics designated by Smith as *Vibrio fetus* and found associated in a considerable series of cases with what is commonly known as infectious abortion in cattle. He properly maintains that the isolation in pure culture of a definite morphologic entity, a vibrio, with practically the same biologic characters, from a series of cases of the same clinical complex, establishes a presumption in favor of the

1. Smith, Theobald: J. Exper. Med. 28:701, 1918. Smith, Theobald, and Taylor, Marian S.: Ibid. 30:299 (Oct.) 1919. Smith, Theobald: Ibid. pp. 313, 325. Smillie, E. W.; Little, R. B., and Florence, Laura: Ibid. p. 341.

specific identity of the organism and also in favor of the inference that such organisms are etiologically related to the diseased condition. It might be assumed that *Vibrio fetus* found in the fetal membranes is merely an invader from the more external genitalia or from the blood after the fetus has been damaged by other agencies. However, the fact that disease of the fetal membranes has been produced experimentally by injection of pure cultures of the vibrio strengthens the presumption that it may be a true cause of infectious abortion.

The new investigations indicate that many cases of abortion in cattle occur without evidence of the presence of Bang's bacillus. In general, *Bacillus abortus* is associated with first pregnancies, and its presence rapidly diminishes in frequency in later ones. Apparently an immunity to this bacillus may become developed in cattle, whereupon *Vibrio fetus*, and perhaps to a far less degree, miscellaneous septic and pyogenic micro-organisms, may become the inciters of abortion in later pregnancies. If these conclusions become substantiated by further studies, it will become clear that abortions in cattle are attributable to a variety of infectious and noninfectious agencies. Even now it seems established, however, that the udders of a relatively high percentage of cows become infected with *Bacillus abortus*, probably during their first abortion disease. In this way the relation of this micro-organism to the milk and consequently to human health is worthy of consideration.—*Jour. Amer. Med. Ass'n.*

While a number of the prominent Canadian members were absent, the "Chilly North" was well represented at the A. V. M. A. meeting.

BRITISH HONORS FOR COLONELS WHITE AND MARSHALL.

We are very pleased to note that at a recent meeting of the Royal College of Veterinary Surgeons, London, England, the names of two of our distinguished members are among those who were elected Honorary Associates of the Royal College, viz., Colonels David S. White and Clarence J. Marshall. This is quite an honor, and THE JOURNAL heartily congratulates the recipients, in which we have no doubt the profession generally will join us, as it is only conferred for distinguished service of some kind.

ASSOCIATION NEWS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

THE FIFTY-SIXTH ANNUAL MEETING OF THE A. V. M. A.

The second southern meeting of the A. V. M. A., during the fifty-six years of the Association's existence, recently held in the City of New Orleans, has now passed into history. The A. V. M. A. was to have met in New Orleans in 1914, but on account of the extensive epizootic of foot and mouth disease raging at the time, the meeting was called off, owing to so many of the members being on duty in their respective states in connection with the outbreak. However, while the postponement was a disappointment at the time, we believe the Association gained by it in the long run, as many more members were added to the organization in the interim, and hence a larger attendance was ensured by the wait of a few years.

Perhaps the chief desideratum in connection with the late meeting was the weather; and if any one has any fault to find with the variety served up to them during the week of the 56th annual meeting, they are surely very hard to please. If previous arrangements had been made with the "weather man," he could not possibly have been more considerate. The weather was simply ideal; and we believe everybody returned home with that impression; and with pleasant recollections of their trip to the Crescent City.

Members and visitors arrived early, and when the meeting was called to order by President Moore for the opening session, the large auditorium of the Hotel Grunewald was comfortably packed, and with many ladies among the audience.

Governor Ruffin G. Pleasant, of Louisiana, who was to have welcomed the Association on behalf of the State, was unavoidably absent on official duty, commissioned Dr. W. H. Dalrymple to take his place, which he did by extending the Governor's regrets, and adding a few extemporaneous remarks of his own by way of welcome.

His Honor Mayor Behrman extended a warm welcome to the Association to the City of New Orleans. Mayor Behrman is not altogether unknown to many of the members, as he attended the

meeting in New York in 1913, and extended a hearty welcome to the Association to meet in New Orleans in 1914—the meeting which had to be called off.

On behalf of the Louisiana State Board of Health, the Association was warmly welcomed by its distinguished President, Dr. Oscar Dowling, who, as a sanitarian, has a national reputation.

The foregoing addresses were responded to by Dr. David S. White, of Ohio, Dr. John W. Adams, of Philadelphia, who was to have done so, being late in arriving.

The work of the Association was, as usual, divided into sections, all of which had full programs of interesting topics for discussion. A very interesting part of the program was that devoted to the Army Veterinary Service, both at home and abroad, and which included the British Army Veterinary Service, a paper being presented by Col. D. S. Tamblyn, Regina, Sask., a member of the Canadian Service.

In addition to the papers presented on the Army Veterinary Services, there were some excellent slides and moving pictures showing the activities of the A. V. C. both in the United States and abroad, the films being in charge of a representative of the Signal Corps of the U. S. Army; and the Army Veterinary Service was represented at the meeting by Lieut.-Col. R. J. Stancliff, Assistant Director of the Army Veterinary Corps, and Major Robert J. Foster from the office of the Surgeon General.

Among other matters of importance, the Section on Sanitary Science and Police was occupied with discussions on Infectious Equine Anemia, or Swamp Fever; Abortion Disease; Tick Eradication; Tuberculosis Eradication; Parasitic Diseases; Carriers of Anthrax Infection, etc.

The Ladies' Auxiliary, also, had their section, and transacted business in connection with their branch of the Association.

An invocation was offered by Mrs. F. H. Schneider, Philadelphia, after which a few words of welcome were presented by Mrs. W. H. Dalrymple, of Baton Rouge, La.; and the president's address was delivered by President Mrs. W. Horace Hoskins, of New York City.

The officers for the Auxiliary for the ensuing year are: President, Mrs. W. H. Hoskins, New York City; Recording Secretary, Mrs. Chas. E. Cotton, Minneapolis, Minn.; Corresponding Secre-

tary, Mrs. Ash Lockhart, Kansas City, Mo.; Treasurer, Mrs. Thos. E. Smith, Jersey City, N. J.

The entertainment feature was all that could be desired, and everybody seemed to enjoy it. The ladies were kept busy seeing the sights of New Orleans, and were given a card party and luncheon at the Southern Yacht Club. Perhaps the most pleasurable part of the entertainment, participated in by both ladies and gentlemen, was a three hours' boat trip on the Mississippi River seeing the extensive system of docks and warehouses at the Port of New Orleans. An elegant excursion steamer was provided, where dancing was enjoyed by both the older and younger members and their wives; and a "spieler" was on board to point out and explain what was to be seen as the S. S. Sydney glided up and down the "father of waters." It should be mentioned that the steamer trip was a donation, to the Association, from Pitman-Moore Company, of Indianapolis, Ind.

The annual banquet was, as usual, very much enjoyed by a large number of those attending the meeting. The selection of Dr. John W. Adams, of Philadelphia, as toastmaster, who was introduced by President V. A. Moore, was a very happy one, and in his inimitable way, played his part well, his amusing introductions of the various speakers invariably bringing forth roars of laughter. The toast, the "Chilly North," was responded to by Dr. C. D. McGilvray, of Toronto, Canada, who interspersed his remarks with numerous stories about the "Land O' Cakes," the Doctor himself hailing from the country of Bruce, Burns, Carlyle and other Scottish notables. "The Sunny South" was responded to by Dr. C. A. Cary, of Alabama, our new President, who, although not a Southerner born, has lived south of the Mason and Dixon line for well nigh thirty years, and was able to expatiate on the South's great possibilities. Mrs. Ash Lockhart, of Kansas City, spoke for the Ladies' Auxiliary in a delightful little speech which was much enjoyed. Dr. R. W. Tuck, of New Orleans, did the honors for our great national Bureau of Animal Industry. Major Robt. J. Foster replied entertainingly for the Army Veterinary Service. Dr. Fred. J. Mayer, of Louisiana, responded for the Medical Profession in a delightful speech, splendidly delivered, which captured his auditors, and finished by a recital of his famous "Sanitary Kiss," which "captured the crowd." Finally, "The Ladies" were looked after by Dr. J. H. Blattenburg, of Lima, Ohio. And every one who knows Blattenburg is

aware that he is at his very best when his attention is directed toward the fair sex. So it goes without saying, that he did the toast full justice.

We believe it was conceded by all that the New Orleans meeting was one of the best in the history of the Association, both in point of attendance, in the quality of the program, in the entertainment provided, and in the delightful weather conditions during the entire time; and that all left with pleasant recollections of the big city of the Pelican State, and with the hope that it might not be so very long before they again had an opportunity to enjoy the hospitality which is proverbial of the South.

The City of Columbus, Ohio, was voted the 1920 meeting of the Association, where a very large outpouring of the profession is anticipated.

The following officers were elected for the coming year:

President, Dr. C. A. Cary, Auburn, Ala.

Secretary, Dr. N. S. Mayo, Chicago, Ill.

Treasurer, Dr. M. Jacob, Knoxville, Tenn.

Vice-Presidents: Lieut.-Col. J. H. Gould, U. S. Army; Dr. E. A. Watson, Lethbridge, Alberta, Canada; Dr. E. P. Flower, Baton Rouge, La.; Dr. A. Eichhorn, New York; Dr. A. S. Cooley, Cleveland, Ohio.

Dr. Jno. R. Mohler, Washington, D. C., was elected Editor and Business Manager of THE JOURNAL of the Association to succeed Dr. W. H. Dalrymple, of Baton Rouge, La., who had resigned.—D.

No use discussing toastmasters. Dr. Adams "takes the cake"; you can't beat him.

President Moore's address was a splendid effort, and ought to be read and studied by every member.

Dr. and Mrs. A. H. Baker are faithful in their attendance at the A. V. M. A. meetings, and we feel sure they must have enjoyed themselves at the New Orleans function.

Dr. J. F. Winchester seems to look younger and enjoy himself better at each succeeding meeting of the Association. His recent appointment by the American Public Health Association is a distinct honor to the profession.

OTHER ASSOCIATIONS.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION.

ANNOUNCEMENT.

The next meeting of the Minnesota State Veterinary Medical Association will be held in St. Paul, Wednesday and Thursday, January 7 and 8, 1920.

C. P. FITCH, Secretary.

WESTERN NEW YORK VETERINARY MEDICAL ASSOCIATION, INC.

The sixth semi-annual meeting of the Western New York Veterinary Medical Association will be held December 12, 1919, at the Erie Co. S. P. C. A. Building, 121-123 W. Tupper St., Buffalo, N. Y. The meeting will be called at 1 p. m. sharp. All licensed practitioners of Western New York are cordially invited.

F. F. FEHR, Secretary.

NEBRASKA VETERINARY MEDICAL ASSOCIATION.

The twenty-second annual meeting of the Nebraska Veterinary Medical Association will be held December 9-10, 1919, at the Lincoln Hotel, Lincoln, Nebraska.

After postponing the meeting last year on account of the war conditions we are putting forth considerable effort to make this a rousing good meeting and expect to have a large attendance.

We have secured some excellent material for our program, which is timely and popular, for the purpose of creating as much interest as possible.

S. W. ALFORD, Secretary.

THE ILLINOIS-MISSOURI VETERINARY MEDICAL ASSOCIATION.

This Association held its thirteenth semi-annual meeting in East St. Louis, Ill., on October 30. An excellent clinic was held

in the morning at the hospital of Dr. Menestrina; and in the afternoon a lively program was gone through which called forth plenty of interesting discussion. The literary part was held at the city hall.

The Association reports a healthy growth, with a few new members being added at each meeting.

The next meeting of the Association will be held in St. Louis, Mo., some time in April, 1920. The officers of the Association are:

President—Dr. Jenneman, St. Louis, Mo.

Secretary—Dr. Finnegan, Chester, Ill.

Treasurer—Dr. Ratz, Red Bud, Ill.

NORTHWEST WISCONSIN VETERINARY ASSOCIATION.

The second annual meeting of the Northwest Wisconsin Veterinary Association at Eau Claire closed with a banquet at the Eau Claire Cafe. Interesting business sessions were held during the day, some very instructive papers being read. Twenty-eight members of the Association were in attendance.

Dr. A. P. Lien, of Stanley, was elected president; Dr. T. Wigglesworth, of Eau Claire, vice president; Dr. H. E. Horel, of Augusta, secretary and treasurer; and H. A. Smeltzer, of Baldwin, trustee for three years.

The following were the speakers:

Anæsthetics in Practice—Dr. W. F. Nolechet, Thorpe.

Differential Diagnosis and Treatment of Swine Diseases—Dr. J. T. Percell, Madison.

Case Reports—Dr. J. B. Collins, Chippewa Falls.

The Use of Strychnine in Cattle Practice—Dr. A. J. Abbott, Marshfield.

Case Reports on Equine Hemorrhagic Septicemia—Dr. Leonard Hart, Jr., Chippewa Falls.

Veterinary Current Events—Dr. O. H. Eliason, state veterinarian, Madison.

Those present were: H. A. Smeltzer, Baldwin; S. O. Lewis, Glenwood City; H. E. Horel, Augusta; A. J. Abbott, Marshfield; L. R. Cummings, Spring Valley; E. M. Stein, Elmwood; W. J. Nolechek, Thorpe; G. I. Gregory, Colfax; W. R. Swan, Stevens Point; C. A. Brown, Red Wing, Minn.; P. E. Nulph, Greenwood;

M. B. Ketchpaw, Bloomer; J. B. Collins, Chippewa Falls; J. B. Wilson, St. Croix Falls; H. E. Hensel, Arcadia; O. H. Eliason, Madison; J. T. Percell, Madison; L. G. Hart, Sr., Chippewa Falls; Wm. F. Kuester, Menomonie; A. F. Brown, Eau Claire; T. Wrigglesworth, Eau Claire; Birt Wrigglesworth, Eau Claire; H. D. Larzelare, Menomonie; J. F. Mack, River Falls; M. E. Nugent, Ellsworth; A. L. Troessler, Mondovi; Robert Dixon, Superior; G. B. Kramshuster, Bloomer.

REPORT OF THE ANNUAL MEETING OF THE BRITISH COLUMBIA VETERINARY ASSOCIATION.

The annual meeting of the British Columbia Veterinary Association was held in the Knights of Pythias Hall, Victoria, B. C., on September 25, 1919.

The business meeting of the Association was called to order at 9:30 a. m. by the Vice-President, Dr. A. J. Damman, who read a telegram from the Hon. Dr. S. F. Tolmie, our President, regretting that he would be unable to be present, being in Ottawa, and hoping that we would have a successful meeting and a good time in his home town. Dr. A. J. Damman then outlined the activities of the Association during the past year, particularly its efforts to secure an adequate system of meat inspection for British Columbia, and stated that a bill had been drafted by the Association and a great effort had been made to get it passed at the last session of the legislature, securing support from three-fourths of the city and municipal bodies, various clubs and women's organizations throughout the Province, they sending telegrams to the chairman of the Provincial Board of Health and their local member. A deputation of the Association, consisting of Drs. Damman, Jagger and Chester, being introduced by Dr. S. F. Tolmie, had interviewed members of the Cabinet on the subject and had convinced them of the necessity for better meat inspection, which they acknowledged. However, the bill failed to pass, but the legislature agreed to appoint a Committee on Public Health, to which a veterinarian, a member of this Association, would be appointed, the committee to report at the next session of the legislature in January. Dr. Damman then requested the members on their return home to start a campaign of public education to the necessity for proper meat inspection and that he felt sure that a bill would be passed in January making at least

a start on compulsory meat inspection covering the more populated areas in British Columbia.

The Vice-President then referred to a complaint received during the past year from one of the members over the sale of biological products direct to farmers and stock men, which was considered detrimental to the veterinary profession and live stock interests, as the laymen were not trained to use such products successfully. A committee had been appointed who had interviewed agents of some of the leading biological companies, and he outlined the result and suggested the matter be discussed further later. Dr. Damman then suggested the by-laws be amended so that associate members be allowed to vote but not hold office and concluded by saying that in these days of unions it was up to the members to support the Association, to secure proper recognition of the profession and to the individual members of it.

The Secretary, Dr. K. Chester, then read the financial statement and was able to report a better showing than last year.

Dr. Chester also reported that while away on a vacation on Vancouver Island he had found out that a Dr. A. Macdonald had been appointed to the Provincial Veterinary Service, he not being a member of the Association, which is directly contrary to the B. C. Veterinary Act. Dr. Chester said that being in Victoria he had gone to the Parliament buildings and interviewed Dr. D. Warnock, Deputy Minister of Agriculture, on the subject, showing him a copy of the B. C. Veterinary Act. Dr. Warnock replied that the Civil Service Commission had recognized the Animal Contagious Diseases Act, which states that an inspector can be appointed, notwithstanding the B. C. Veterinary Act. The existence of this clause was not known to the Association.

Dr. Chester then discussed the matter on a different basis with Dr. Warnock, who was glad to support the Association, and agreed to request from the Association, as Deputy Minister of Agriculture, an interim certificate for Dr. Macdonald, good until the date of the next examination. This was received, and interim certificate granted, and Dr. A. Macdonald was present at the meeting, and was quite willing to join the Association and had expressed his intention to take the examination in the regular way in November. Discussion ensued and it was requested that the incoming Council attempt to get the clause in the Animal Contagious Diseases Act amended.

In addition to the subjects mentioned in the Vice-President's address which were discussed, the subject of the indiscriminate giving of tuberculin direct to farmers by a government department, a specific case being mentioned by Dr. Howell, and the use of tuberculin by private practitioners, and the testing of the animals a few days later by the provincial inspector, not knowing that they had been injected a day or two previously. Discussion took place and it was agreed that when a private practitioner made a test he should fill out a report to the government immediately, and in the matter of supplying tuberculin to farmers, Dr. Chester suggested that now would be a most opportune time to take the matter up intelligently, Dr. S. F. Tolmie being Minister of Agriculture, and a committee was appointed to interview him on the subject.

The Secretary then read various correspondence, which was approved, and a letter from the Hon. S. F. Tolmie resigning as President of the Association on account of his public position, but promising active support of the Association and profession as before.

The election of officers then took place, ten being nominated. The following seven were elected: President, Dr. A. J. Damman; Vice-President, Dr. H. Keown; Secretary-Treasurer, Dr. Kenneth Chester; Council, Drs. Turley-Brooks, White and Jagger; Examiners, Drs. Chester, Turley-Brooks and White.

At the conclusion of a most successful business meeting the members were guests of the Rotary Club at their luncheon, 150 of the business men of Victoria being present. After the luncheon short remarks on the necessity for meat inspection were made by Drs. Damman, Strong and Chester, the Rotarians showing their accustomed interest by asking questions, and they promised their support.

In the afternoon the members made a trip in automobiles to various farms in the Saanich District, including that of Dr. S. F. Tolmie, and in the evening a public meeting was held, the speakers being Dr. Damman on meat inspection, and lantern slides made by Dr. Davis, at present in Alberta, of conditions found on inspection in a packing plant, explained by Dr. Bruce. Then a few remarks by Dr. Strong, meat inspector for the City of Vancouver, on the same subject. Dr. Bruce, of Agassiz, then read a very interesting paper on some of the poisonous plants of British Columbia, showing beautiful pressed specimens of the

plants, and took great pains to show how to distinguish the poisonous plant, wild parsnip, that causes the death of a good many cattle yearly in this Province. Dr. T. A. Sleeth made a few remarks on the diseases of dogs, and answered questions.

This brought a most successful annual meeting to a close.

KENNETH CHESTER, Sec.-Treas.

SPEECH BY DR. WM. THOMSON AT ROTARY CLUB LUNCHEON.*

Gentlemen Rotarians: In my brief address today, I desire to say that while the properly qualified veterinarian may never receive the same *éclat* as his medical compeer, yet he is equally responsible and absolutely indispensable for the preservation of the public health, inasmuch as he is the only authority on disease transmissible from the lower animals to mankind. Whilst most medical doctors have failed to impress the powers that be of the necessity of meat inspection, this is no wonder, because they are by their qualifications unfitted to pass an opinion on animals that supply us with milk, meat, butter and cheese, dripping and lard, which are the main constituents of our diet. They are peculiarly devoted to the *cure* of disease in man; and fortunate is the person afflicted with diseases like tuberculosis, for example, whose bank roll can command the best attention. But what of the uncomplaining poor: they may get advice from hospitals and clinics, perhaps supplemented by some medical treatment. A corner in a sanitarium is not always available, and the local hospitals do not always have beds for them, and in lots of places they are not wanted at all.

No man sets himself a higher task than he who labors to prevent the infection of his kind from tuberculosis and kindred diseases, obtainable from the lower animals. In my opinion, Dr. Torrance, the Veterinary Director General at Ottawa, is doing more to safeguard the children and susceptible people of Canada from this dreaded scourge than all other institutions together. Now, with the advent of Dr. S. F. Tolmie to the portfolio of Minister of Agriculture, we are already informed of the Dominion department's intention to institute the accredited herd system, by which in time, if applied to all sections, would reduce tuberculosis in cattle to a very large extent. But until there is some proper system of meat inspection in this Province, and so long as the Dominion Meat Inspection Service has to maintain the high

* Read by Secretary Chester.

standard set for excellent quality of meat for export to foreign countries, the absence of any provincial standard for the protection of the home consumer from what is left, is highly detrimental to the national health.

Last week I destroyed a milch cow for tuberculosis; and on post mortem examination I found the lungs containing tubercles as large as three inches in diameter. The lungs were rotten, but the owner remarked on the nice looking meat in the quarters. I asked him if he would cook the lungs and feed it to his family. He replied: "Certainly not." "Why, then, would you use the quarters?" I asked. Now, gentlemen, had this cow been killed in one of the many filthy rural slaughter houses of this Province, is there any one here credulous enough to believe it would have been condemned? No! the lungs with all the evidence of disease would in all probability have been cut out and not destroyed, but thrown to the swine herd that usually are waiting under the killing floor to receive not only the trickling diseased blood but the entrails of all animals slaughtered, including that of their own kind. When we know that the blood in the living animal circulates and makes a complete round of the body in a few seconds, and from the diseased tissues to the healthy tissues, it follows *ipso facto* that if one part be diseased extensively, the other parts must at least contain the elements of susceptibility. And if we feed our children on susceptible meat, it follows again, their tissues are being built on such elements, and must also become susceptible to tuberculosis. If uninspected milk is apt to convey to our children tuberculosis, there is no less danger eating the flesh and organs that produce this milk. Some people might contend that meat is generally well cooked and in this state will not convey disease. Cooked or uncooked, I maintain it contains all the elements that make for disease. For instance, manure a piece of barren soil sufficiently and see if you do not get a good crop. The tubercle bacilli lives on manured soil, or in other words, fertilized tissues that have had to exist on the elements of susceptible meat. This explains why the poorer classes have more tuberculosis by far as compared with the well to do classes. The latter can always afford to buy the very best meat, whereas the old cows sold in the many markets go to the men who cater to the poorer class of people.

In India, where I lived many years, I never saw or heard of tuberculosis among the three hundred million Hindus; but

among the fifty million moslems this disease was fairly common. The Hindus only eat mutton, which is seldom if ever tuberculosed; the moslems eat the flesh of cows like white people. Now let's turn to the Jews. Who ever heard of this unhygienic living race having consumption? Very seldom if ever. The rabbi will not allow his people to eat any meat that on the killing floor (and that is the only place to see it, gentlemen) shows the least sign of this disease. Is all this not sufficient proof that our people are being continually afflicted by this plague through the medium of uninspected meats. Gentlemen, a rigid milk inspection without a rigid meat inspection is only a half-hearted protection. In fact all the money spent in killing tubercular milch cows in this Province cannot obtain for the people the desired full protection without a rigid system of inspecting the carcasses of food animals in all the slaughter houses. Many butcher shops now contain the sign on their fronts "Government Inspected Meat." Let me tell you that if you do not see the label affixed to the portion of meat from which your cuts are taken, and bearing the words "Canada Approved," your meat has not been inspected by the competent federal meat inspectors, and that the shop sign is only calculated to deceive the public on that point. I can give you many instances of what I term emergency meat. The following will suffice: Somewhere in British Columbia this year, a farmer had a cow which for days labored to deliver a calf, and at last being exhausted she collapsed. The owner, instead of sending in good time for a veterinary surgeon, was too mean to pay for one, and as a last resort he operated by cutting through the animal's sides and extracted two beautiful live calves. The cow after undergoing such a cruel operation, without the aid of chloroform, was then killed, and subsequently I heard that the meat was put on the market.

Just two or three weeks ago I saw a cattle buyer going round the upper country buying for some butcher on the coast. He was told of a cow for sale, but the owner remarked that "she was thin, as she had not got over some sickness yet." "Is she living?" asked the buyer; "well, then, if she can walk, bring her along." My observations in the Orient as well as in the Occident, makes it easy for me to state emphatically that the tuberculous cow is the most common disseminator of tuberculosis in the world, by her flesh as well as her milk, and most veterinary surgeons know this. A healthy cow is a prize and a blessing to its owner; but a

diseased one is a curse; and, gentlemen, you cannot cure a curse, you can only prevent its breeding and spreading and in this way control it. Because every veterinary surgeon knows this, it behooves us to see, if we desire pure food, free of disease, that the most eminent veterinary surgeon in every Province is placed at the head of the Departments of Agriculture. Then we will begin successfully to control tuberculosis, instead of from hospitals, sanitariums and clinics, which can only give their attention to the already afflicted.

The butchers all over this Province, with few exceptions, buy what they like, kill what they like, and sell it to the meat-eating public, without any supervision or control, far less inspection. Some are conscientious, but the majority are not. And, gentlemen, this is the crux of the tuberculosis situation. Rotary may say what she chooses, collect money as if by magic, and build scores of clinics, but until she can give a better use to humanity than mere cure—so excellent and charitable in itself—of human beings, her high purpose will not appeal with the same force and power to those whose minds are capable of a higher reasoning, in favor of the prophylactic, or preventive measures.

To abate this infection in mankind, we must necessarily attack the roots that lie in the source of impure foods that come to our tables wearing a mask of innocence, and liberate the people from the evil clutches of such an insidious foe, which the skill of veterinary surgeons has demonstrated beyond the shadow of a doubt.

Gentlemen Rotarians, will you help us to protect our Canadian people from a system which, however excellent and imperative to preserve our export trade to protect the foreign consumer, militates against the Canadian national health?

Will you help us to impress the powers that be of the necessity of passing a law as speedily as possible that will guarantee to our people a healthy supply of meat, and remove from the face of our civilization forever the scars of tuberculosis?

I know that Rotary will help, because she has already won the respect and admiration of all classes, and she must be jealous that that confidence is never shaken. Long live Rotary.

WILLIAM THOMSON, V. S.

The presence of so many of the older members of the Association at the New Orleans meeting was quite marked, notwithstanding the "dry" times prevailing.

COMMUNICATIONS.

To the Editor:

May I request a little space in the next issue of THE JOURNAL for the following:

"VETERINARY ASSOCIATION OF ALBERTA BAR VISITING BROTHERS.

It would appear that the executives of the Veterinary Association of Alberta have lost sight of the object of an Association meeting and clinic when they excluded from entrance on Nov. 5 a visiting veterinarian holding annual license from the veterinary association of Saskatchewan for the year 1919 and also membership card from the A. V. M. A. as a member in good and regular standing for the year 1919."

Yours very truly,

N. D. CHRISTIE, B. V. Sc.

1109 15th Ave. West, Calgary, Alta., Nov. 6, 1919.

Secretary Mayo, on instructions from the Executive Board of the A. V. M. A., sent a floral tribute to the memory of Mr. Harry C. Moore of Indianapolis, Ind., and the following letter received by the Secretary from Mrs. Moore is self explanatory:

"Dear Doctor Mayo:

I want to express to you, and through you to the American Veterinary Medical Association, my sincere appreciation for your sympathy and for the beautiful floral tribute to the memory of my dear husband.

The knowledge of the high regard and the genuine friendship that so many of your profession had for him is a source of the greatest comfort to me to know.

Most sincerely,

MARY S. MOORE."

THE PROFESSION NEEDS ADVERTISING.

To the Editor:

In your publication for November, 1919, there appeared an article by William N. Berg, entitled "How to Raise the Stand-

ards in Veterinary Education," in which Mr. Berg advocated making the veterinary school requirements exactly parallel with those of medical colleges.

I shall endeavor to point out that Mr. Berg's stand is poorly taken, for he has depreciated the profession unwarrantedly and in the proposed system for improvement has placed least emphasis upon the most essential point: publicity. I will quote a part of the article, which is as follows:

The following quotation is from the Bulletin of Yale University, School of Medicine, 1918-1919, p. 19:

"ADMISSION OF STUDENTS.

"PREPARATION FOR MEDICAL STUDIES.

"Students who enter college with the idea of subsequently studying medicine should realize that the broader the foundation a professional man can obtain the more efficient he will be. Those who are in a position to do so are recommended, therefore, to complete their college course before entering the School of Medicine, including in it the necessary special studies in the sciences.

"In view of the fact that circumstances do not permit all prospective medical students to complete their college course, *two years of college work has been fixed as the minimum general requirement for matriculation in this school.* Work in Schools of Dentistry, Pharmacy and Veterinary Medicine is not accepted as the equivalent of college work."

The last sentence shows how high veterinary colleges stand in the esteem of certain university authorities. Although this sentence was not found in several other medical school catalogs it is plainly implied there. This means that a second year student in Cornell Veterinary Medical College, for example, who changed his mind and decided to study human medicine, would find that he was not eligible to enter the medical schools of Yale and other universities, although he had just finished two years in a good professional school.

I beg to suggest that Mr. Berg has misinterpreted the intention of medical colleges in refusing to accept veterinary education as pre-medical work. It seems that the explanation of their decision is stated in that first line of the bulletin extract above quoted, which informs us that "the broader the foundation a professional man can have, the more efficient he will be."

A broad education is one that includes a knowledge of the arts. This knowledge is essential not only for mental development, but for imparting to its possessor a cultural standing so necessary in any community. To accept other professional studies as pre-medical training would be to develop an ultra-professional or scientific man only capable of doing research and

having no prerequisite training for dealing with the public. This attitude of medical colleges, therefore, does not depreciate the standing of veterinary schools.

Similar requirements, I grant, should be applied to veterinary students and could be if the veterinary profession enjoyed the same popularity as that of the medical profession. Until recent years veterinary medicine was not so essential to the nation's welfare, but as its importance is now being sharply felt and as the demand for veterinarians far exceeds the supply, the most logical way to improve the profession is to first build it up numerically, according, however, to a sufficient standard.

The only way to accomplish this is to advertise.

There is but one reason for all the ambitious young men of our rurals attending agricultural colleges when some should study veterinary medicine; and that reason is the general lack of information about the profession, its attractions and importance. Agriculture is advertised by county agents, and while the veterinary profession does not have such an efficient medium, means could be and should be developed.

A campaign in our cities could produce several good results. I venture to say that one-half their inhabitants are ignorant of the existence of the veterinary medical science, and an enlightenment might accomplish great things. To interest city men would be to first increase the number of veterinarians, and, second, induce city-bred men to seek the rurals, thereby improving the communities both professionally and mentally.

These recommendations may seem to be off the point, but before veterinary medical standards can be raised there must be sufficient veterinarians to supply the needs and at the same time naturally improve the personal professional standards by the laws of survival of the fittest. Until this is accomplished a system of increased entrance requirements for veterinary schools would tend to drive away the few men who are now applying and thus further reduce the present inadequate force. *The profession needs to be advertised.*

RAYMOND WELLS,
Student, Univ. of Penn.

The Southern boys know how to fix up for a real good convention, and they want another A. V. M. A. meeting back South before so very long—so they say.

NECROLOGICAL.

DR. HUGH FRANCIS DORIS.

Dr. H. F. Doris died August 15, in New York City. He was a graduate of the American Veterinary College, class of '85, and afterwards enjoyed a large practice, succeeding his father in Pittsburgh, Pa. He subsequently took up the study of human medicine in West Penn. Medical College, Western Reserve Medical College, and Jefferson Medical College, but failed to graduate. He then studied for the bar in West Virginia University, and while there trained the athletic teams. Finally he located in law practice in New York City.

THE JOURNAL has no record of Dr. Doris being a member of the A. V. M. A.

DR. E. C. ROSS.

Dr. E. C. Ross, New Haven, Conn., died on August 15, at his home in New Haven.

Dr. Ross was a graduate of the American Veterinary College, class '84, and while his name does not now appear on the present list of members of the A. V. M. A., he was an active member until his retirement from active service about 1910.

Dr. Ross was one of the most prominent members of the profession in the State of Connecticut; admired by his brother practitioners, and always ready and willing to give advice to the younger members. He had acquired sufficient to live comfortably after retirement, but for the past year or two was quite feeble, and gradually succumbed to an incurable cancerous condition of the rectum.

Some of the older members who attended the New Haven meeting in 1906 will remember Dr. Ross as being the "guiding star" on that occasion.

DR. R. H. BIRD.

Dr. R. H. Bird, who resided at Greeley, Colorado, and had for many years been a prominent member of the profession of his

state, died at St. Anthony's Hospital in Denver on October 26. The immediate cause of death was a venous hemorrhage at the base of the brain resulting from an injury to the jaw received while vaccinating cattle.

Dr. Bird was the son of James and Helen Amy Hewitt Bird of Kirkliston, Linlithgow, Scotland, where he was born on May 17, 1854. He was a member of the British Royal College of Veterinary Surgeons, and graduated from the Royal (Dick) Veterinary College, Edinburgh, April 17, 1873. Subsequently Dr. Bird served as a veterinary inspector in Ireland from 1878 to 1883. He later went to Australia, from where he came to the United States, and served as State Veterinarian of Montana from 1895 to 1897. Soon afterwards he moved to Greeley, where he has since resided.

Dr. Bird became a member of the U. S. Veterinary Medical Association in 1895, and has since held membership in that organization and its successor, the American Veterinary Medical Association.

The Doctor was a prominent member of the Colorado Veterinary Medical Association, having served as its president for two successive years. He was treasurer of the Colorado Board of Veterinary Examiners at the time of his death.

His lodge affiliations were numerous, he having been associated with the Knights of Pythias, Elks and Masons. In his death the profession of Colorado, as well as the A. V. M. A., loses one of its ablest members.

DR. WATT ASHCRAFT.

Dr. Watt Ashcraft, of Monroe, N. C., died recently at his home as the result of a punctured wound of his foot setting up blood poison. We understand that the Doctor had been suffering from diabetes for several years, which no doubt had the effect of weakening his constitution and hurrying on the final issue.

Dr. Ashcraft was born at Rock Rest, N. C., July 22, 1887, and graduated from the Chicago Veterinary College in 1908. He was married in 1912 to Miss Viola Willson, of Baltimore, and is survived by his widow, mother, four brothers and a sister.

He was a member of the North Carolina State Veterinary Medical Association, and took a very active part in its delibera-

tions. He was also a member of the North Carolina State Board of Veterinary Examiners for several years; and he was a member of the A. V. M. A.

His fellow-practitioners in North Carolina regarded Dr. Ashcraft as the leading veterinarian in the state.

In a beautiful tribute to his memory, by Rev. J. E. Abernethy, of Salisbury, N. C., there appears the following:

"In a classic sense Dr. Ashcraft was not a scholar, but he had learned well the divine art of thinking. His mind moved with the accuracy of a full-jeweled watch. He was a master of his profession. If the dumb animals of Union County were given the power of intelligent speech, they would rise up in a body and call him blessed.

"He was preëminently a gentleman. He proudly wore the integrity of a plumed knight, and looked with disdain upon every form of fraud. He walked the royal highway of honor, and kept the company of his self-respect. He had the elements of a real man. He admired truth, and despised falsehood. He loved honesty and hated hypocrisy. He lived a clean life, and frowned upon every wretch who blights the flower of virtue."

MRS. HAMLET MOORE.

Mrs. Hamlet Moore, wife of Dr. Hamlet Moore, New Orleans, La., died September 28, 1919. Mrs. Moore before her marriage was Miss Haydee Sitgef. She was 44 years of age and the mother of four children, two boys and two girls ranging in ages from 16 to 20 years respectively.

Dr. Moore and the surviving children have the sympathy of THE JOURNAL, but it is far more consoling to know that the mother had fulfilled all her obligations on earth and leaves a loving memory.

The "sanitary kiss" recommended by Dr. Fred. J. Mayer at the banquet of the A. V. M. A., did not quite appeal to all of the ladies present, especially the younger set.

The visiting ladies seemed to have a great time seeing the sights of New Orleans, some of whom took advantage of the famous French Opera.

MISCELLANEOUS.

HORSE AND HUMAN INFLUENZA.

Writing in the *New York Medical Journal* Major George A. Soper, Sanitary Corps, U. S. A., presents a paper on "Influenza in Horses and Men," which, containing facts from army investigations, is published with the permission of the surgeon general. "Economically," writes Dr. Soper, "influenza is the most important disease of horses in temperate climates." Boston realizes this in peculiar fashion, since its great fire gained headway at a time when horses were incapacitated by the epizootic. The mortality among remounts in the recent army due to influenza has been many times more than to all other causes together. It is estimated that more than 25,000 horses purchased in Canada and the United States for the British Army during the years of the war died on this side of the ocean while awaiting shipment. In the Army of the United States the loss among the horses amounted to \$100,000 a week.

Epizootics have occurred from the earliest historic times. Italy had an important one in 1301; in 1711 it followed the tracks of great armies over Europe and in 1870-73 it was a pandemic occurring with the Franco-Prussian war. Its spread over this country was a wave. It appeared in Toronto in September, reached Buffalo and Detroit in the first two weeks of October, by the third week it had spread to Bangor, Albany and New York and then quickly invaded a wider district. It reached Milwaukee the first week in November, and about the same time was observed in Raleigh and Charleston and by the end of the month had touched Houston, Texas, and Little Rock. In December it reached Colorado, in January it was in New Mexico and Utah, by March and April it invaded the West Coast and Mexico and by summer time it was in Guatemala. It affected more than a million equines.

Mortality rates of horses last year at the army shipping ports ran as high as 150 per thousand per year, which figure makes it comparable with losses from human maladies.

Dr. Soper draws an analogy between the human and the equine influenza, and suggests that close study of horses' influ-

enza may help in the human disease. He notes that it spreads at about the rate of the transportation of horses and points out the fact that humans travel very much more quickly. It is not so surprising, therefore, that the recent pandemic ran over the country with such speed.



MR. HARRY C. MOORE.

(A SHORT BIOGRAPHY.)

Mr. Harry C. Moore, of Indianapolis, notice of whose untimely death appeared in the November JOURNAL, was born in Delaware County, Indiana, in 1874, and grew to manhood there. His parents, John L. and Lorinda (Lewis) Moore were natives of the same county, and their respective parents were among the pioneers who reclaimed Indiana from the wilderness and its original savage owners.

In his early manhood, Mr. Moore was associated with his father in the wholesale grocery business in Indianapolis, and later became purchasing agent for the White Knob Copper Company, Mackay, Idaho. In 1905, he became treasurer for the Pitman-Myers Company at Indianapolis, which at that time operated a small pharmaceutical laboratory, manufacturing a limited line of physicians' supplies. The growth of the company, after Mr. Moore became associated with it, was rapid, and in 1906 a new pharmaceutical laboratory building was erected in the heart of the business section of Indianapolis. In 1913 Mr. Moore became president of the company, and it was reorganized under the name of Pitman-Moore Company; and in the same year the Veterinary Biological Laboratories of the company were established.

It happened that Mr. Moore's death occurred in Indianapolis at the time of the Conference on Tuberculosis Eradication was being held in Chicago, and the following resolutions, concerning his death, were adopted by the conference:

"Whereas, Death has taken from us one of our valued friends and one who always had the live stock interests of the nation at heart; and

Whereas, In the death of Mr. Harry C. Moore, of Indianapolis, Indiana, the federal and state officials, as well as the entire veterinary profession, have lost a valuable and energetic co-worker; therefore, be it

Resolved, That we deeply mourn his loss, and that the memory of his friendship shall ever be a bright spot in our lives; and be it further

Resolved, That a copy of these resolutions be sent to his family with our love and sympathy."

SCHOOLED VETS GET GOOD POSITIONS.

The army emphasizes the fact that it offers a useful training to its enlisted men which will be of value after their return to civil life. This is aptly illustrated in the activities of the Medical Department.

One of the most important functions of the Veterinary Corps is its meat and dairy inspection service. This Corps is responsible for the inspection of all meats and meat and dairy products purchased for the army. To maintain this important work, the Corps established officers and men at the packing house center in Chicago.

All men selected for this duty in the Veterinary Corps are first given a thorough course of instruction, consisting of lectures, demonstrations and practical work, under officer specialists, to qualify them as assistants to the veterinary meat and dairy inspection officers.

Their services as trained assistants are needed not only at the packing centers, where large contracts for these products are made, but also at all army posts. This inspection is maintained at all points of purchase, trans-shipment points, and places of issue.

The Surgeon General has lately received letters from three of the leading meat packing companies stating that they are now employing discharged army men who were trained in this work by the Veterinary Corps, and that in every case their services are found to be very satisfactory. Their salaries in one company average \$35 weekly, while in the other two a salary of \$40 weekly is paid.—*The Come Back*.

DR. WINCHESTER'S EFFORTS APPRECIATED BY HIS PEOPLE.

Bulletin 72 of the U. S. Department of Agriculture, which calls attention to the menace which tubercular cattle are to the public health, has called forth the following from *The Leader* (Lawrence, Mass.) concerning the splendid work of Dr. Winchester in that connection:

"For thirty-two years Dr. John F. Winchester of this city has been carrying on his campaign of education on this very question. If I am not mistaken, it was Dr. Winchester who first presented this matter in a Massachusetts state report, and he has continued the battle against the tubercular cow ever since, contending against official indifference and public apathy on the one hand, and commercial and agricultural greed on the other. His fight might have been well compared to the tilting of Sancho Panza against the windmill, so far as immediate results were concerned; but he has succeeded in establishing the truth that he has been standing for, as this official publication of the U. S. government shows.

"It is a result that repays Dr. Winchester for his ceaseless stand for the lives and health of the little children of the nation."

THE JOURNAL congratulates Dr. Winchester, and delights in such splendid appreciation being afforded one of the staunch members of the veterinary profession.

APPOINTMENT FOR DR. WINCHESTER.

Dr. John F. Winchester has been notified of his election to the committee on meat inspection of the American Public Health Association.

The letter of notification follows:

Boston, Mass., Nov. 5, 1919.

Dr. John F. Winchester,
Lawrence, Mass.

Dear Dr. Winchester:

I am taking this means of notifying you of your election as a member of the committee on meat inspection, of the section on food and drugs, of the American Public Health Association, at the recent meeting of the Section, held in New Orleans. Mr. George H. Shaw, Chief, Division of Housing and Sanitation, Room 615, City Hall, Philadelphia, Pa., is chairman of this committee.

Sincerely yours,

JAMES O. JORDAN, Executive Secretary.

We feel sure that the veterinary profession of this country will appreciate the appointment of Dr. Winchester as a decided compliment, not only to himself, but to the profession generally.

Dr. Winchester's aim in this sort of work has always been the prevention and alleviation of human suffering and distress, in their association with the lower animals, through suggestion and sound advice as to the most reasonable and feasible methods.

To be elected on such an important committee of the American Public Health Association is a high honor, and THE JOURNAL heartily congratulates Dr. Winchester, who is so eminently worthy of it.

NOTICE BY THE UNIVERSITY OF WISCONSIN.

To meet the calls for a veterinary training from Wisconsin's returning soldiers, the State Board of Education has asked the university authorities to establish the first two years of a course in veterinary medicine.

Replies to the questionnaires, recently sent out by Governor Philipp to determine how many of the state's soldiers and sailors would avail themselves of the \$30 a month bonus, indicated that a considerable number wish to study veterinary medicine. No institution in the state has been training men to enter the veterinary profession.

Upon the recommendation of the State Board of Education the university will give the first two years of a four year professional course in veterinary medicine. Although designed primarily for bonus students, the course will be open to any who can satisfy the entrance requirements of the university. Officials of the institution are planning that students who complete the two years' work will be qualified for advanced standing in any of the veterinary colleges of the country. Besides work in the department of veterinary science, the course will include instruction in the departments of bacteriology, chemistry, animal husbandry, physics, physiology, pharmacy, and zoölogy.

Stockmen in many sections of the state have frequently championed the proposal to establish a veterinary course. They argue that improved stock raising is growing so rapidly in Wisconsin that a strong staffed and well equipped course in which to train veterinarians would be a profitable investment for the state.

Among the missed members at New Orleans were Drs. Rutherford and Torrance, of Canada, both former presidents of the A. V. M. A. Their absence was unavoidable, however.

The Ladies' Auxiliary of the A. V. M. A. was well represented at the recent meeting. Their membership seems to be increasing both in numbers and in interest.

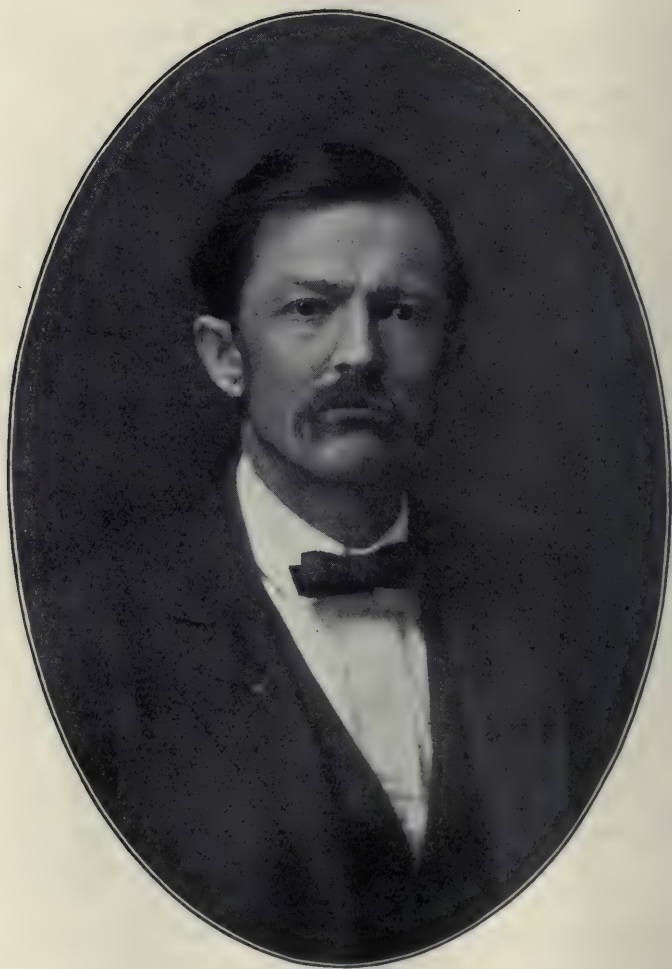
Dr. M. H. Reynolds, of Minnesota, rarely misses an annual meeting, and was at New Orleans displaying his usual interest in Association matters.

Northern members attending the meeting appeared to enjoy the celebrated Louisiana pecans, as a number of orders were left for consignments.

The Army Veterinary Service illustrations were a great asset to the program of the meeting.

The time to begin to get ready for the 1920 meeting at Columbus is right now.

The "men in khaki" added a military air to the annual meeting.



PRESIDENT C. A. CARY

JOURNAL

OF THE

American Veterinary Medical Association

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(Original Official Organ U. S. Vet. Med. Ass'n).

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No. 4

PRESIDENT C. A. CARY

OUR newly elected president, Dr. Charles Allen Cary, is an American by birth as well as in sentiment and practice. On his father's side his lineage is traceable to a vigorous, thrifty strain of the English stock that came to the Massachusetts Bay Colony in 1634, and on his mother's side he is of Scotch-Irish descent. Thus he was favored with a rich combination of racial characteristics to begin the battle of life.

About 1857 William Cary, his father, and Lucy Ellen Cary, his mother, were attracted to the fertile plains country that was developing so rapidly west of the Mississippi river. They migrated from the East to Millersburg, Iowa, and it was here that Dr. Cary was born on November 27, 1861. During his early life in Iowa, Charles worked and studied with more than the average industry of the growing boy. In 1885 he was graduated from the Iowa State College with high standing, among the first ten upon whom the degree of Bachelor of Science was conferred. In 1887 he completed the course in veterinary science in the veterinary department of the same institution, and graduated with the degree of Doctor of Veterinary Medicine.

After graduation Dr. Cary located at Keokuk, Iowa, and pursued the practice of veterinary medicine there until 1889, when he accepted the position of professor of veterinary science in the South Dakota Agricultural and Mechanical College. He remained in South Dakota until 1892, with the exception of the winter of 1890, which was spent in post-graduate work at the University of Missouri. At the beginning of the year 1892 he accepted a temporary assignment of three months at the Alabama Polytechnic Institute, and the remaining nine months of that year were spent in the study of medicine and language in Germany. On his return from Europe, in 1893, he accepted the chair of veterinary science in the Alabama Polytechnic Institute and has been a member of the faculty of that institution continuously to the present time.

In addition to his duties as professor in the college, Dr. Cary has been actively engaged in agricultural, live stock, and important community matters. For a number of years he has been rendering distinguished service in Alabama as State Veterinarian; he served a long term as a member of the Auburn City School Board, and for more than twenty-five years he has served as president of the Alabama Live Stock Association. As a churchman Dr. Cary is of the Presbyterian faith, and his high standing in the community is also reflected favorably in the honors that have been conferred upon him by various organizations of which he is a member, notable among which are the Masonic and Knights of Pythias fraternities.

Busy as his life has been in endeavors to elevate his profession, in teaching and in investigations in veterinary science, in advancing agriculture, in promoting the live-stock industry of the Southland, and in serving his community, he has found time to write many papers, both technical and popular, and his articles on sanitary, public health, and live-stock matters are sought by the editors of our leading publications in those fields. His high ideals, his comprehensive vision, his tenacity of purpose, his unflagging zeal and devotion to his profession and his friends command universal admiration and respect.

The A. V. M. A. is to be congratulated on its selection of so competent and worthy a representative of the profession as its president, and THE JOURNAL joins his many friends in wishing him a successful administration.

ECHOES FROM THE NEW ORLEANS MEETING

THE veterinarians of America have gloriously passed another milestone in the history of the profession. The fifty-sixth annual meeting in New Orleans was a splendid success from the smallest feature of the entertainment to the execution of the most technical part of the program.

In all, the program was excellently arranged and combined a discussion of a wide variety of practical subjects. Near the close of the session it became rather congested and required another half day to complete it. Among the participants on the program were representatives from all parts of the United States, as well as from Canada. A careful study, however, reveals the fact that the practitioner was not so well represented as he should have been. Nevertheless no one individually should be censured for this because it is a condition that must be remedied through closer co-operation.

The officers, the various committees and the Executive Board admirably fulfilled all their obligations without respect of persons and, so far as could be observed, for the interest of the Association and its future welfare.

The attendance was far more than was expected, considering the long distance that many had to travel and the high cost of living and transportation. More than 500 men and about 150 ladies registered, and it is presumed that a few of the members and a number of the visitors did not record their names.

For the occasion the weather was ideal. The days were clear and invigorating, while the evenings were balmy but tinged with sufficient sharpness of the atmosphere to induce pleasant sleep. Not a drop of rain dampened the streets, nor did a cloud darken the sky.

The ladies appeared to be busy every minute and their stay was one continuous round of pleasure. The men enjoyed their presence and only wished there could have been more of them, for the charming qualities of the fair sex go a long way toward making any convention a success.

The playhouses, the French Opera, the boat ride, and the restaurants with their characteristic cuisine were generously patronized and hugely enjoyed. Very little more could have been wished for; in fact, not even excluding the president's reception and the banquet, it was one of the most democratic occasions that we have had an opportunity to observe.

The election of officers passed off with very little confusion, and the newly elected officials promised solemnly to render a full measure of efficient service to the entire Association regardless of factions or sections. The honor of the A. V. M. A. should be paramount in their minds, and, with such resolutions in view, the members will strive with them to that end.

For a long time members had been anticipating the meeting. Therefore they began to arrive as early as Sunday, and, with the exception of a few, did not leave until the following Friday. The lobby of the Grunewald during mornings, noons and evenings was constantly filled with groups of old friends recalling experiences of bygone days. Let us hope that the same friends may be permitted to greet one another again under similar happy conditions.

E. I. S.

A REVIEW OF 1919

OUR Association is indeed fortunate in having called to its service men like Ex-President V. A. Moore and President C. A. Cary during these trying days of reconstruction. The sterling ability, the rare resourcefulness and the untiring efforts of such men, who have been and who are now leading the American Veterinary Medical Association to more important public service, are valued possessions in making for the success of our organization.

It was with a feeling of deep regret that the members saw the term of Dr. Moore come to an end. His administration of 15 months was characterized by continued progress, as great as any in the history of the Association. It would be impossible to summarize the extent of Dr. Moore's service or the many activities supported by him during the year. He was ever at the beck and call of State organizations and other medical and veterinary gatherings which needed his inspiration and advice. He, with many others, was instrumental in obtaining from the National Congress increased funds for paying better salaries to veterinary inspectors. He traveled to a number of States to present educational and sanitary control matters of international importance which would prove beneficial to the A. V. M. A. During his administration there were 772 applicants elected to membership, which is the second highest number that have been taken into the Association at any one meeting. While this is very satisfactory, it is equally pleasing to note by the treasurer's report that the financial condition of our organization has become greatly improved. Notwithstanding the vastly

expanded cost of conducting our affairs, this healthy state of the finances will permit larger projects to be undertaken in the future. Moreover, it will allow the Association to attain a higher place in keeping with its objects and to become more truly the great American association whose prosperity depends on the advancement of the veterinary profession of America.

THE NEW HOME OF THE JOURNAL

SOME complaints of the delayed arrival of the January issue of THE JOURNAL will probably be received from some of our subscribers. By way of explanation our readers are reminded that THE JOURNAL is now printed in Washington, D. C., instead of Baton Rouge, La., and that incidental to the change there have been some unavoidable delays. Until the new arrangement is complete and in smooth working order we must ask our readers to bear with such delays as may occur in the receipt of their copies.

The new editor of THE JOURNAL enters upon his duties at a most unpropitious time. Unfortunately this year the International Live Stock Show, the meeting of the United States Live Stock Sanitary Association, the hearings before the Agricultural Committee of the House of Representatives and those before the Congressional Commission on the Reclassification of Salaries have all been crowded into the month of December with the holiday festivities. In addition the United States Fuel Administration has ordered the publishing houses in this city to remain closed on Tuesdays, Thursdays and Saturdays in order to conserve the coal supply and this will greatly handicap the printers in getting the January number out promptly. However, our predecessor has already requested forbearance on the part of the subscribers until some of these unavoidable complications have adjusted themselves.

The hearty co-operation of all the members of our Association is earnestly solicited, as THE JOURNAL has reached the stage when it can not be handled successfully by any one individual. We particularly urge the practicing veterinarians to send in the papers that they present at the various State and county meetings, also reports of their interesting cases. THE JOURNAL can not cater to the needs of the practitioner unless the practitioners themselves provide the papers and case reports requested.

MORE AND BETTER LIVE STOCK VERSUS PARASITES

WITH the end of the campaign against the cattle tick already in sight, the movement for more and better live stock in the South is attaining considerable impetus. However, in this movement there are certain obstacles to overcome that must not be lightly disregarded.

The eradication of the cattle tick will remove one enemy that has kept the live-stock industry of the South down to its present comparatively small holdings. The expansion of that industry to the larger holdings of better stock that have been rendered possible by tick eradication must, however, be made on a conservative basis or more or less serious trouble is certain to be experienced. In other words, with the eradication of the tick there still remain other parasites that will prove very bothersome to those live-stock owners who fail to observe proper precautions in the management of their animals. Complaints of damage from internal parasites of live stock are becoming more frequent, and a warning by the Bureau of Animal Industry to the veterinarians of the South at the recent meeting of the American Veterinary Medical Association at New Orleans brought out the fact that the warning was none too early and that serious losses among horses, mules, cattle and sheep were occurring on many farms through the neglect of certain fundamental principles in the control of parasitic diseases.

The South generally has a climate which furnishes certain very injurious parasites with conditions highly favorable to their propagation, that is, a climate characterized by abundant warmth and moisture throughout almost the entire year. The check on these parasites imposed in the Northern United States by dry and cold seasons is largely lacking. Attempts, therefore, to stock southern pastures up to approximately what their feed production would seem to warrant or to the extent commonly practiced in cooler, drier climates, are likely to result in considerable wastage from losses by parasitic diseases, if not in the first year, then in the two or three years necessary for the pastures to become heavily infested, during which time also there may be a tendency to increase the holdings of live stock beyond the number that may be safely carried on a given area.

The spread and development of man and his live stock in tropical and semi-tropical countries has always been limited by parasites, and it is only by adequate control of parasites that civilized man

can expect to maintain himself and his flocks in prosperity in warm countries. In the South man has suffered from yellow fever, bubonic plague, malaria and hookworm, all diseases due to parasites or carried by parasites. The first two have been eradicated, the last two are being controlled. His live stock has suffered from Texas fever and its tick carrier and from many kinds of parasitic worms and insects. Texas fever and the tick will soon disappear, but the problem of controlling worm and insect pests is now urgently demanding solution. Serious losses at the very beginning of the new live-stock industry in the South will tend to give the project a bad reputation that it may take years to live down. The time has come for all persons interested in the southern live-stock industry to insist that appropriate measures be taken to protect it from the hindrance of uncontrolled parasitic diseases.

Some of the important measures that will help to control parasites under southern conditions and to prevent serious losses are as follows: A large margin must be maintained between the number of live stock on a given area and the number which that area will apparently support as judged by northern standards. Provision should be made for frequent movement to fresh grazing areas; the use of permanent pastures should be minimized; forage crops should be utilized as much as possible, and low-lying, swampy areas should be avoided. Horses, swine and ruminants (sheep and cattle) may be grazed in turn upon the same fields with little risk of serious spread of parasitic diseases from one kind to another, but sheep and cattle can not follow one another with safety in the absence of other precautions, as several kinds of parasites, including the stomach worm, are common to both sheep and cattle. Because the dog is responsible for the conveyance and spread of certain dangerous parasites of man and live stock, the all too common wandering dog must be suppressed.

It is safe to assume from the outset that parasites in small numbers at least are always present and liable to become troublesome if given an opportunity to increase in numbers. This opportunity may come with an unusually wet season or through the failure of the live-stock owner to take measures to control parasites, which, under conditions favorable to them, multiply rapidly and soon become numerous enough to cause great damage. Together with measures for controlling parasites, the use of medicinal treatment will commonly be necessary, and in this connection competent veterinarians who have learned the best methods for the treatment and

control of parasites can render valuable service to the live-stock owner.

In addition to the practical application of such knowledge as is already available, the inauguration of a more comprehensive program of research along the lines of parasite control in the South is imperative. Every southern experiment station should have a capable parasitologist on its staff to investigate local conditions and to add much-needed information to our comparatively meager knowledge of parasites in the South. Liberal provisions should be made for such investigations, as their cost will be many times repaid by the avoidance of the losses that will surely follow through ignorance of the proper management of live stock to avoid damage by parasites.

B. H. R.

NEW MEMBER FOR EXECUTIVE BOARD

On account of the expiration of Dr. J. R. Mohler's term of office on the Executive Board a new member is to be elected by postal card votes from District No. 4. This district includes Maryland, Virginia, District of Columbia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky, Tennessee, Cuba and South America. Return postal cards for nominations are being sent out from the Secretary's office.

EDITOR'S NOTES

Unfortunately, none of the proceedings or papers of the New Orleans Convention has reached this office as yet, so we are forced to go to press without any of this material. However, we hope to have the entire proceedings in our possession in time to start publishing the first papers in the February number.

Every member of the A. V. M. A. who has not paid his dues for the current year should send in \$5.00 immediately to the Secretary's office. The final statement is being sent out to those who have not paid for the present fiscal year. Don't delay in sending your remittance as you will miss your JOURNAL, because it will be necessary to stop the Journals of those who have not sent in their dues.

PROGRESS IN HOG CHOLERA CONTROL¹

By U. G. HOUCK, Washington, D. C.

THE IMPORTANCE OF THE SWINE INDUSTRY

THE United States at the beginning of the present year contained approximately 42 per cent of all the hogs in the world. Our swine population at that time numbered 75,587,000, which was more than the combined total number in any other ten countries. This number does not include those farrowed since January 1, 1918, and marketed before January 1, 1919. During the past year the flesh of swine constituted nearly one-half of our meat diet, and more than two-thirds of our total exports of dressed meat were pork products, while of animal fats exported more than five-sixths was lard. Within the last ten years the population of this country has increased about 39 per cent. Our pork production is the only branch of the meat industry that has been able to keep pace with the rapid increase of population. When it is realized that in one year (1918) we produced 11,226,000,000 pounds of pork products, with a surplus of about 2,250,000,000 pounds, it is evident that this great and growing national industry is deserving of our fostering care.

HOG CHOLERA THE MOST DESTRUCTIVE DISEASE OF SWINE

It is established by evidence on every hand that hog cholera has been and continues to be the greatest impediment to the swine industry, since it, with its complications, is responsible for about 90 per cent of the mortality of hogs that die on farms and in feed lots. Last year more than two and one-half millions of hogs in the United States were allowed to die from hog cholera. The fact that for the past 11 years we have had a reliable preventive treatment at our disposal and yet have allowed this heavy loss to continue seems to indicate that we are not giving to the swine industry as much protection as it should receive.

CONFIDENCE ESTABLISHED IN SERUM

In 1908 the United States Department of Agriculture commenced to urge the immunization of swine against hog cholera by what is known as the Dorset-Niles treatment. While State institutions seemed slow to realize the possibilities from the use of this treat-

¹ Presented at the twenty-third annual meeting of the United States Live Stock Sanitary Association, Chicago, Ill., December 1, 1919.

ment, commercial establishments grasped the opportunity to supply the public demand for serum and virus, and up to July 1, 1913, they were allowed to prepare and handle these products in their own way without State or National supervision.

The impotent and contaminated serum and virus placed upon the market prior to the passage of the virus-serum-toxin act, together with faulty technique in administering the treatment and the inability of many veterinarians to differentiate hog cholera from other swine diseases, produced disappointing results in so many instances that the immunization treatment was not growing in popularity as it deserved. In some sections it was regarded with doubt and in some instances with disfavor. Up to this time the Department had undertaken no extensive field experiments or demonstrations for the eradication of hog cholera, but during the widespread outbreak of the disease in 1912 the Bureau of Animal Industry decided to conduct in selected areas some demonstrational and investigational hog-cholera work, directed by the Biochemic Division, in co-operation with the State regulatory authorities and extension divisions of Agricultural Colleges, to ascertain the best adaptable methods for controlling hog cholera and to show livestock owners and others how they might reduce their losses from the disease through the proper use of potent serum and virus properly administered in conjunction with the application of quarantine and sanitation. A sum of \$75,000 was made available through appropriation by Congress for conducting such activities during the fiscal year 1913. At the beginning of the fiscal year, July 1, 1912, the work was commenced in Dallas County, Iowa, and before the end of the calendar year it had been extended to four counties, each located in a different State.

The results obtained from the use of serum in connection with the other repressive measures employed were so gratifying and the demands for extension of the service were so pressing that on February 23, 1914, Congress appropriated \$450,000 to continue the activities against hog cholera. The work was gradually extended to 17 counties in different portions of the country in the latter part of 1914, but the outbreak of foot-and-mouth disease in the fall of that year made it necessary to drop it in two counties and interfered with it materially in others. The satisfactory results obtained by the Bureau and the co-operating agencies established confidence in the preventive treatment and gave an impetus to the production and use of serum throughout the country, and hog production was

greatly increased in the areas covered by the demonstrational and educational work.

EXTENSION OF HOG-CHOLERA CONTROL WORK

Funds were provided by Congress to continue the work during the fiscal year 1916, and on January 1 of that year the Office of Hog-Cholera Control was established in accordance with the policy of the Department to segregate research, extension and regulatory work from each other. Up to this time the activities in the selected counties were carried on with free serum and virus administered by Bureau veterinarians free of charge. This plan served a useful purpose, but it proved impractical and too expensive for extending the activities to cover a larger territory. Therefore in 1916 the Department discontinued furnishing free serum and the operations were restricted to 10 States but extended to cover larger areas in each State. Under this arrangement assistance was given to 127 counties in the 10 hog-growing States selected.

The sum provided by regular appropriation for hog-cholera work was increased in August, 1917, by an allotment of \$196,400 from the war emergency funds, which made it possible further to intensify the work and to extend it within the remainder of the fiscal year from 127 counties in 10 States to 295 counties in 14 States. A special feature of the project in 1917 was the successful efforts in enlisting the support and co-operation of practicing veterinarians, resulting in more uniform and successful methods of treatment and charges.

The allotment from the war emergency fund for hog-cholera control for the fiscal year 1918 was increased to \$202,965. By the judicious use of this sum, in addition to the regular appropriation, the Bureau was able to extend further its co-operative activities from 295 counties in 14 States to State-wide efforts in 34 States. The extension of the work as a war measure gave swine breeders better protection against losses from hog cholera than they had ever before received, and there was an increase of about four millions in our hog production and a marked decrease in the losses from swine diseases. The mortality fell from 119.9 per 1,000 in 1914 to 42.1 per 1,000 in 1913, which was the lowest in 35 years.

PROGRESS OF THE WORK DURING THE LAST FISCAL YEAR

In April, 1919, the Office of Hog-Cholera Control was made a division of the Bureau of Animal Industry. The work under this

division has progressed along the same lines as in the preceding year, in co-operation with State regulatory authorities and the extension divisions of State Agricultural Colleges in 34 States where hog raising forms an important part of the farming activities.

There was an increase in hog production of more than four millions over the preceding year, and notwithstanding this large increase in the number of swine and the abnormal conditions that prevailed as a result of the war, the mortality of swine from all diseases was further reduced from 42.1 per 1,000 in 1918 to 41.4 per 1,000 in 1919, which is equivalent to about 37 per 1,000 from hog cholera. This is the lowest mortality that has been recorded in 36 years.

To cope with the abnormal conditions during the war the field force was increased in the early part of the last fiscal year considerably above the average for the 12 months, which made it necessary later to reduce it accordingly and restrict operations in order to hold the expenditures within the limits of the appropriation. As seven States were able to give financial assistance in maintaining the forces in the field until the present appropriation was available, it did not become necessary to discontinue entirely the operations in any State. The assistance furnished by these seven States was appreciated by those engaged in the swine industry as well as by the Bureau.

The work of the field inspectors was materially increased during the year through the necessity of giving attention to the many additional garbage-feeding stations established in the neighborhood of large cities and army camps and the repeated observations of the live stock on farms in various States to which the 614,673 feeder hogs were shipped after immunization at public stockyards.

During the fiscal year ended June 30, 1919, there were 12,336 outbreaks of hog cholera reported to the Bureau inspectors by county agents, live-stock owners and others in the 34 States. A total of 53,586 postmortems were conducted in connection with the 51,022 investigations made on farms where outbreaks of disease occurred. Appropriate literature was widely distributed and 2,734 meetings were held in hog-raising districts for the purpose of forming organizations and giving information to live-stock owners concerning the application of quarantine, sanitation and the serum-prevention treatment as the most successful means of preventing losses from hog cholera. These meetings were attended by 78,584 farmers and others, and in addition the inspectors had personal interviews with 315,359 live-stock owners, bankers, veterinarians,

county agents and others at their homes, places of business, or in the offices at the local headquarters.

During the year 93,512 farm visits were made by the inspectors at the request of the owners or otherwise to observe the conditions of live stock and to give advice and other assistance. There was a marked increase in the number of farm visits last year, because the inspectors have come to realize more fully than ever before that the nearer they can get to the stock raiser the more good can be accomplished, and that there is no place so favorable for discussing these matters with a farmer as in the feed lots on his own farm. In the performance of their official duties the Bureau representatives traveled 2,029,519 miles; they treated 233,987 hogs for demonstrational purposes, and the reports seem to indicate that at least 12,000,000 in addition were treated in the United States by veterinary practitioners and others.

Under the direction of the co-operating regulatory authorities in the 34 States, 9,564 farms were quarantined on account of hog cholera, and 4,382 of these were cleaned and disinfected. Considering the number of outbreaks that were reported during the year, it seems that the importance of quarantine and disinfection is not fully appreciated by either the State authorities or live-stock owners and that these matters are not receiving the attention they should.

During the calendar year 1918 about 528,306,874 cubic centimeters of serum was used, the mortality of swine was further lowered, and in general much good was accomplished; but at the same time swine owners allowed 2,815,000 hogs to die of cholera, which shows that we are not making as rapid progress as we might in preventing losses or in eradicating the disease. The best results that we may hope for, until the work is intensified and extended through more liberal appropriations, closer co-ordination of efforts and more effective co-operation by all concerned, is only a fair control of the disease through the liberal use of serum and the application of such sanitary and quarantine measures as we are able to apply under existing conditions.

Attention seems to be centered on immunization while we are generally negligent in regard to efforts to prevent the spread of the infection from primary outbreaks. It does not seem to be fully appreciated that quarantine, cleaning and disinfection are of as much importance in combating hog cholera as they are in eradicating outbreaks of such diseases as foot-and-mouth disease, glanders or anthrax.

FUNDS FOR HOG-CHOLERA CONTROL

The matter of funds is an important feature of co-operative hog-cholera work. Up to the present time some of the largest and richest hog-growing States have not provided funds to co-operate effectually with the Department in combating hog cholera within their borders. It might be expected that any State receiving assistance from the National Government would appropriate at least as much money for co-operation as the National Government is willing to use in that State. The hog-cholera work has advanced beyond the experimental stage, and in future those States which do not provide adequate funds for co-operation with the Bureau should not expect to receive the same consideration in the allotment of Bureau funds as those which make liberal appropriations for co-operative hog-cholera work.

At the present time the Bureau has 140 veterinarians detailed to hog-cholera work in 34 States. If the States had an equal number devoting their entire time to the work, the losses from hog cholera could be reduced sufficiently to bring very large returns to the swine industry from the investment. We are approaching the time when a State receiving assistance in hog-cholera work will be expected to assign continuously to the work at least as many veterinarians as the Bureau furnishes. Congress appropriated \$446,865 which may be used for hog-cholera control work during the present fiscal year. A recent survey showed that the combined available funds of the 34 States for co-operation with the Bureau probably will not amount to over \$250,000, which is about one-eleventh as much as 44 States have appropriated for tuberculosis eradication work and about one-fourteenth as much as was provided for tick eradication in 1918 by the States and counties in the 10 States where that work was carried on.

From present indications it seems quite probable that the southern cattle tick will be exterminated and that tuberculosis will be eliminated from our breeding stock, while the great losses from hog cholera will continue to drag along from year to year unless swine owners, through their organizations, make known their wishes and give better support to the live-stock sanitary authorities in their efforts to induce State legislatures to make more liberal appropriations to combat hog cholera.

STATE LIVE-STOCK LAWS AND REGULATIONS

There are a number of matters of importance in connection with the hog-cholera work that might be discussed, one of the most im-

portant of which is State laws and regulations. Various State authorities and prominent members of live-stock associations have commented liberally on the variations in State laws and regulations affecting the movement and supervision of live stock to prevent the introduction and spread of disease, and suggestions have been made in regard to the desirability of uniformity. Under present conditions shippers of breeding animals are frequently subjected to inconveniences and annoyances and have a reasonable excuse for their mistake in shipping interstate. The radical differences that exist in the requirements of different States are bewildering and inexplicable and give opportunities for just criticism on account of the apparent contradictions expressed in official regulations. The agents of transportation companies can scarcely be expected to keep themselves informed on the varying requirements and frequent changes in the different States, and in general there is confusion and considerable dissatisfaction.

It seems reasonable to suppose that laws and regulations which have been found necessary to protect one State against the introduction and spread of hog cholera would prove equally effective and desirable in any other State. The differences that exist in State laws and regulations are probably due to the variations of public sentiment that exist in different sections of the country. In some States the live-stock sanitary authorities have been unable, when they have tried, to secure the passage of laws which they know to be important to protect properly the live-stock industry. In other States they hesitate to attempt to enforce the good laws they have because of the low ebb of public sentiment. It is generally recognized that any policy that is adopted for combating contagious animal diseases must have the support of public sentiment to prove successful. This has been demonstrated in the eradication of such diseases as foot-and-mouth disease, sheep scabies and the Texas-fever tick. Where public sentiment is strongly in favor of tick eradication the ticks disappear rapidly, but in those communities where dipping vats have been repeatedly dynamited the extermination of the tick is prolonged and the task is more irksome and expensive.

Live-stock men generally are intelligent, and if they were made to understand, through their organizations or otherwise, that rigid, uniform State laws and regulations are needed better to protect their interests there is no doubt that they would give their support to such measures. There is a need for specifically directed educational work to bring about uniformity in State live-stock laws and

regulations. It might be charged that the requirements of some States are inadequate and that the live-stock sanitary authorities of some States have not given this matter the attention that it deserves.

VARIATIONS IN STATE LAWS AND REGULATIONS RELATING TO SWINE

Recent official correspondence with State live-stock sanitary authorities in connection with the revision of a Bureau publication entitled "State Sanitary Requirements Governing Admission of Live Stock" show the following facts, tabulated to show at a glance the radical differences that exist in State requirements:

Admission of Hogs Intended for Breeding Purposes

	<i>States</i>
No requirements.....	7
Permits required.....	4
Permits required if from public stockyards.....	1
Accepted on affidavit of shipper.....	8
Accepted on affidavit if for exhibit.....	1
Accepted on affidavit or health certificate.....	3
Accepted on affidavit if from a district free from cholera....	1
Health certificate required.....	31
(The time required for premises at point of origin to be free from hog cholera varies from 6 weeks to 6 months.)	
Immunization required.....	13
Immunization required if from public stockyards.....	2
(The time required to elapse before shipment following immunization with serum alone varies from immediately to 30 days, and for serum and virus from 3 hours to 30 days.)	
Disinfection of animals required.....	9
Disinfection of animals required if immunized with serum and virus	1
Disinfection of cars before loading required.....	11
Disinfection of shipping crates required.....	5
Quarantined at destination if from public stockyards.....	3
Health certificates required for hogs intended for exhibition purposes	4

Admission of Hogs Intended for Feeding Purposes

No requirements	8
Permits required	7
Shipments may be made on affidavit of shipper.....	5
Health certificate required.....	30
Health certificate or immunization required.....	3
Immunization required	12
Immunization required if from public stockyards.....	3
(The time required to elapse before shipment following immunization varies from 3 hours to 90 days.)	

	<i>States</i>
Disinfection of animals required.....	10
Disinfection of animals required if treated with serum and virus	1
Disinfection of cars before loading required.....	13
Quarantined at destination.....	7
Quarantined at destination if from public stockyards.....	1
(Time held in quarantine varies from 21 to 30 days; in one State as long as necessary.)	
Not to be unloaded in public stockyards en route.....	9

These figures speak for themselves and other comment is unnecessary. It is suggested that this Association give some attention to this matter. As the first step in attempting to secure more uniform regulations affecting the movement of swine, it is further suggested that the Committee on Hog Cholera might prepare for the consideration of this body a tentative draft of regulations which would seem generally adaptable for governing interstate and intrastate movements of swine and afford a reasonable guaranty against the introduction or dissemination of hog cholera. It is believed that the Federal regulations should be incorporated as a part of State regulations.

In the control of hog cholera the National and progressive State authorities are especially impressed with the importance and desirability of uniform State requirements affecting the following matters:

1. The immunization of swine as a requirement for admission into a State.

2. The enforcement of an effectual quarantine on the farms at destination of all swine from public stockyards or from another State for feeding or breeding purposes.

3. Quarantining premises where hog cholera appears, posting notices and issuing warnings.

4. Compulsory reporting of outbreaks of the disease.

5. Effectual destruction of the carcasses of animals that die of disease on farms and in feed lots.

6. Cleaning and disinfection under proper supervision of infected premises.

7. Cleaning and disinfection of cars and crates used in the transportation of live stock for feeding, breeding or exhibition purposes.

8. Licensing and supervision of garbage-feeding plants.

9. Effectual control of the distribution of hog-cholera virus.

CONTROL OF THE DISTRIBUTION OF HOG-CHOLERA VIRUS

Much might be said on each of the subjects above specified if time permitted, but there is one point that stands out prominently at this time, since laymen seem to be losing their fear of virus and are

inclined in some sections to undertake to use it in the immunization of their own herds and those of others.

The discovery of the effects of hog-cholera virus in conjunction with the use of serum was a wonderful boon to the swine industry. Virus is generally recognized as a vital factor in the control of hog cholera, but it is dangerous. There is no doubt that there have been many outbreaks of hog cholera resulting in great losses through the careless handling and use of this product. The present practice of permitting serum companies to ship virus promiscuously on order without supervision or check is deserving of serious consideration. The State authorities who are charged by law with the protection of the live-stock industry are the proper persons to distribute the virus or control its distribution within their respective States. If only State officials would take control of the distribution of this product they could specify who should and who should not administer the simultaneous treatment, and thus could prevent virus from getting into the hands of incompetent, unreliable and unlicensed individuals.

According to the correspondence previously specified, at present only seven States are attempting to control the distribution of virus. Expression has been given to the belief of many correspondents that the Federal regulations should prohibit the interstate shipment of virus to any but authorized State officials; but the States are not prepared for such a regulation and probably there are some that would oppose it. However, an important step will have been taken toward reducing the losses from hog cholera and toward eradicating the disease when all the States can see their way clear to place the distribution of virus within the States under the control and supervision of the live-stock sanitary authorities.

Dr. Alvin O. Lundell, inspector in charge at South St. Joseph, Mo., who has been in the service of the Bureau of Animal Industry since 1905, has resigned to accept a position with the Albright-Nell Company, of Chicago, manufacturers of packing-house machinery.

Dr. Harry Grafke, in charge of the Bureau work at Fort Worth, Texas, exclusive of meat inspection, after twelve years' service in the Bureau has resigned to enter the employ of a biological house.

Dr. Floyd N. Jenkins of Fort Worth, Texas, has resigned from the service of the Bureau of Animal Industry to accept a position with the State Live Stock Sanitary Commission of Texas.

THE ETIOLOGY OF SO-CALLED INFECTIOUS ABORTION DISEASE OF CATTLE¹

By E. C. SCHROEDER, Bethesda, Md.

AT the beginning of this paper I believe it desirable to say that the disease about which it is my intention to speak, and to which my statements pertain, is the so-called infectious abortion disease of cattle obviously due to the Bang abortion bacillus.

It is in no sense my wish or intention to discredit the belief, or rather the inference, that abortions among cattle, and conditions which lead to abortions, may be caused by germs like the spirillum of Smith and the vibrio of Stockman and McFadyean, or by various septic and pyogenic bacteria, or by the occasional pernicious activity of micro-organisms which commonly inhabit animal bodies as commensal parasites, or even by the absorption of toxic substances; but, unless I am greatly mistaken in my valuation of the known facts, we are reasonably entitled to conclude, no matter how many different causes may be responsible for abortions, that only one common, widespread, infectious abortion disease among cattle has been definitely proved to exist, and that this is the disease of which the Bang abortion bacillus is the prime etiological factor.

I frankly admit, since knowledge is progressive and human conceptions are very mutable, that the discovery of more facts may require in coming time a modification of this conclusion, but that is a matter which we must leave to the future. We are dealing with the present, and the conclusions of any period of time, in the full measure to which they merit approval as a serviceable and rational basis for practical action, should be in harmony with the known facts of that period.

Now, recognizing that abortion disease among cattle may have many causes, the individual nature and importance (either or both) of which remain to be determined, and one cause that has been proved to be both common and widespread, namely, the Bang abortion bacillus, and keeping in mind that efforts guided by a knowledge of the etiology of a disease promise the best results when its control or eradication is undertaken, it seems that it would be advantageous to survey some of the major facts that we know about

¹ Presented at the twenty-third annual meeting of the United States Live Stock Sanitary Association, Chicago, Ill., December 1-3, 1919.

the Bang abortion bacillus and its relation to the animals it attacks.

The bacillus, so far as we have been able to learn, under natural conditions is an obligatory parasite which does not produce spores or special forms that are strongly resistant against the germicidal properties of light and drying. Hence, after it is expelled from the body of one host it does not again multiply until it has entered that of another, and it can not long survive in a free state unless it is well protected against the inclement features of its extra-host environment, and such protection would require that it should be imbedded in a moist, opaque, fairly voluminous and practically neutral medium.

The natural hosts of the parasite are cattle. It may also live in the bodies of other animals, as, for example, guinea pigs, in which it causes extensive, characteristic lesions of disease; rabbits, in the livers of which it may long persist without causing manifest changes; hogs, in which it is being reported with increasing frequency as a cause of abortion disease. But it is reasonably certain that its specifically true hosts are cattle and that its parasitism in the bodies of other animals is incidental and without true significance for its real perpetuation. In other words, we may say that, though the Bang bacillus can live and multiply in the bodies of other animals, it would probably be doomed to early extinction if it could be excluded from those of cattle, in precisely the same sense in which the bovine type of tubercle bacillus, which attacks many different species of animals, the human included, would soon become extinct if it could be excluded from the bodies of cattle.

Taking the host relationship and the general nature of the abortion bacillus into consideration, we may conclude that it is an organism with which it is not difficult to deal during its extra-host period through the practice of scrupulous cleanliness and the use of simple disinfectants, and that the disease it causes is an evil which spreads in the great majority of cases, quite probably, only through fairly intimate contact between infected and susceptible cattle.

Like many other parasites, bacterial as well as those of higher order, the abortion bacillus shows a marked preference for special regions of the bodies of its hosts. Its commonest habitat in the bodies of cattle, and the organ in which it persists longest, is the udder. Next to this is the pregnant uterus, or, more definitely, according to an investigation recently published by Dr. Theobald Smith, the outermost layer of the placenta. It also, but less frequently, inhabits the seminal vesicles and epididymides of bulls.

In the udder multiplication evidently is slow, and in the pregnant uterus rapid. About its multiplication in the reproductive organs of bulls we have no data on which we can base conclusions.

When the udder is infected, in practically all the cases examined, the supra-mammary lymph glands are also infected, and this is just what should be expected, since they are the glands through which the lymph system drains the udder. The occurrence of the bacillus in these glands indicates that it may enter the lymph and blood streams from the udder, and the failure to detect it in the numerous tests that have been made to discover it in tissues from all other parts of the bodies of cows with infected udders, like blood, spleen, liver, kidneys, brain, bone marrow, synovial fluid, ovaries, fallopian tubes, lymph glands, etc., seems to prove that the bodies of cows generally, apart from their udders and pregnant uteruses, do not provide a suitable habitat for it.

Presumably, when the abortion bacillus penetrates deeper into the body from an infected udder, unless it reaches a place like the pregnant uterus where it can establish itself and multiply, it is rapidly destroyed. That it can reach the pregnant uterus from the udder is proved, first, by inoculation experiments, in which the pregnant uterus was infected through the introduction of abortion bacilli into the udder through the teats with a milking tube, and, second, by the frequency with which the placentas and uteruses of cows with infected udders contain abortion bacilli even when such cows are apparently healthy and calve in a seemingly normal manner.

The abortion bacillus can not be proved to be present in the udder of every cow that is affected with abortion disease, neither can it be proved to occur in the pregnant uterus of every cow that has an infected udder; but this much is true: In the udder it may persist anywhere from a few weeks to seven or eight years, and, while it persists, if the examinations thus far made are reliable, at least half of the parturitions, though they may be manifestly normal in character, are accompanied by the dissemination of abortion bacilli from the uterus via the vagina. And this is a matter of exceptional importance, because it clearly shows that seemingly healthy cows are often long-lived carriers of abortion bacilli, and that such carriers, in addition to eliminating abortion bacilli more or less continuously with their milk, in a large proportion of cases expel them in a dangerous way during and shortly after calving and probably shortly before.

Studies relative to the occurrence of abortion bacilli in the non-pregnant uterus have given the following results. When an infected cow has aborted or calved, irrespective of whether the calving is or is not attended by sensible abnormal phenomena, the uterus and the material discharged from it may, and in a large proportion of cases do, contain abortion bacilli. The infected condition lasts from a few days to a few weeks. As a common rule, tests to discover abortion bacilli in the uterus three weeks after an abortion or a parturition give negative results, though we have one case on record in which they persisted nearly two months. The latter must be looked upon as a rare exception.

When abortion bacilli are injected directly into the non-pregnant uterus they disappear in a few days; and judging from numerous tests made at estrual periods and at other times, copious repeated injections of suspensions of abortion bacilli into the veins of non-pregnant cows do not infect the uterus.

Here we may conclude that the period during which abortion bacilli are disseminated by infected cows in large numbers is limited, because the parasite inhabits only two portions of their bodies, one, the udder, indefinitely, and the other, the uterus, for limited periods of time. From the infected udder the bacillus is discharged more or less continuously in small numbers, and from the uterus periodically in large numbers.

To overcome the danger due to abortion bacilli discharged from the udder should not be difficult. Milk is a valuable product and ordinary economy prevents it from being scattered about promiscuously in a cow stable. If it is accidentally spilled where it may do harm it should be sprinkled with lime or some other simple disinfectant. If it is sent to a creamery or a cheese factory from which skim milk or by-products are returned to the farm, the skim milk or the by-products should be sterilized before they are fed to animals.

At one time I advanced the opinion that abortion infection might occur through the udder with bacilli drawn into the teats during milking from the hands of milkers who had previously milked cows with infected udders. But, though I know perfectly well that abortion bacilli reach the uterus from the udder and that abortion disease can be produced by injecting abortion bacilli into the udder through the teats, I doubt whether this mode of infection has much practical importance. It is a possibility that should be kept in mind until further investigations have thrown more light on it, and a danger

which I believe can be avoided by washing the hands before going from one cow to another during milking.

The danger due to the bacilli discharged from the uterus when abortions occur and in connection with parturitions—and this evidently is the prime danger—should be controlled through the use of maternity stables. Cows should be moved to such stables the moment they show the first sign of approaching parturition or the least symptom of what may be a coming abortion, and should be segregated in such stables after calving or aborting until all abnormal discharges from their uteruses have ceased. The products of abortions and the by-products of parturitions should be disposed of in a manner which will prevent the exposure to them of cattle that are susceptible to abortion disease.

The maternity stable removes the cow from the herd during the approximately two to three weeks per annum in which she is very apt to be exceptionally dangerous—the only two to three weeks per annum during which cows affected with Bang abortion disease positively are known to scatter abortion bacilli in large numbers and in a dangerous way. And it is imperatively necessary in this connection to bear in mind constantly that the seemingly healthy carrier of abortion bacilli, the cow which shows no sign of her infected condition and calves in a seemingly normal manner, may be a superlatively dangerous disseminator of abortion germs at and shortly after her time of parturition.

In speaking about the habitat of the abortion bacillus in the bodies of cattle I failed to say anything about the various portions of the bodies of aborted fetuses and recently born calves in which it has been found, but it does not seem necessary to say much. The occurrence of the bacillus in fetuses impresses me as being similar to its presence in a sponge that has been immersed in a fluid contaminated with abortion bacilli, with this exception, that their digestive tract contains a fluid in which it can multiply and become very numerous. From the bodies of calves the germ disappears soon after they are born, even though they drink the milk of dams with infected udders.

Regarding calves I would suggest that it may be well to bear in mind that those which enter upon their independent existence from an infected uterus may expel abortion bacilli via their bowels during the first days after they are born, and also that those which are suckled by dams with infected udders may expel abortion bacilli,

against which they themselves are immune, via their bowels until shortly after they are weaned. This is simply a suggestion which is not supported by concrete evidence. Tests regarding it have been planned but I can not predict the results that they will give.

The importance of bulls as disseminators of abortion bacilli remains an open question. Investigations reported by Buck, Creech and Ladson of the Pathological Division of the Federal Bureau of Animal Industry prove beyond dispute that the reproductive organs of bulls occasionally show lesions which harbor abortion bacilli. It is very easy to assume that bulls with infected reproductive organs infect cows at the time of copulation; but to assume is one thing and to prove is another, and assumptions and confirmed facts are often contradictory. In this case the available evidence does not at all tend to prove that bulls infect cows through the act of copulation.

At the Experiment Station of the Bureau of Animal Industry it was proved that the seminal fluid of one naturally and two artificially infected bulls was contaminated with abortion bacilli. Cows served by these bulls have remained entirely free from abortion disease. Service occurred on neutral ground, where the exposure of the cows to the bulls was limited as strictly as possible to the act of copulation. The injection of suspensions of abortion bacilli into the uteruses of cows just prior to copulation has failed to infect them. The evidence that other workers have obtained relative to the infection of the cow with abortion bacilli at the time of copulation fails to incriminate the bull. This is all perfectly compatible with the rapid disappearance of abortion bacilli from the non-pregnant uteruses of cows. The habitat of the abortion parasite in the pregnant uterus is the chorionic epithelium or something else which does not exist prior to or at the time of copulation.

However, bulls must not be regarded as innocent carriers of abortion bacilli, as the expulsion of the bacilli from their seminal vesicles or other portions of their reproductive organs is not necessarily limited to the time of copulation, and we have no valid reasons to believe that abortion bacilli disseminated by bulls are less virulent than those which have their origin in cows. On the contrary, they may be found to be exceptionally virulent strains, as the relatively infrequent occurrence of lesions in bulls, notwithstanding their frequent exposure to infection, leads to the assumption that the exposures which cause the lesions must be to particularly virulent strains of bacilli, or that they must occur at a time when ordinary

susceptibility is somewhat enhanced, or that lesions are limited to bulls with abnormally low resistance.

In abortion-infected herds it would be a good plan to have separate quarters for bulls and to have all contact between bulls and cows limited to the time of service, which should occur on neutral ground or ground which ordinarily is not occupied by either the cows or the bulls.

It seems to me that we have, in all, four sources of abortion bacilli which must be taken into consideration in our efforts to combat Bang abortion disease, and that the four sources are those which I have tried to define, as follows: The udders of infected cows, the uteruses of infected cows, the discharges from the bowels of unweaned calves produced and suckled by infected cows, and bulls with infected reproductive organs.

Our knowledge on the susceptibility of cattle to the Bang bacillus points directly to pregnancy as the critical period. Calves, so far as we have been able to determine, are immune; at least those which are exposed to infection during the first three to five months of their lives and are known to have ingested an abundance of infected milk prior to weaning, if they are later protected against exposure, not only fail to show symptoms of abortion disease but are also negative to abortion tests. What the conditions are through which a small proportion of bulls and virgin heifers become infected remains unknown.

We know that virgin heifers may harbor abortion bacilli in their non-functioning udders after intravenous injections, and that bulls may harbor them in their testicles after direct injections into the testicles, but these are modes of exposure that do not occur in nature unless it is in the form of rare accidents. The results of such injections merely show that the udders of virgin heifers and some portions of the reproductive organs of bulls may serve as satisfactory places of residence for abortion bacilli.

It is my belief that the susceptibility of cattle for the Bang bacillus gradually increases from calfhood to sexual maturity; or, more definitely, that the organs of cattle in which the bacillus can maintain itself do not become a suitable habitat for it until considerable progress has been made toward sexual maturity, which practically amounts to saying the same thing twice. If heifers well advanced towards sexual maturity are persistently exposed to abortion bacilli, or are exposed under conditions which occasionally lead to the ingestion of massive doses, there is no reason for doubt-

ing that from time to time some of the bacilli may enter the lymph and blood streams through the mucosa of the digestive tract, and this would at once give them a location and significance identical with that of intravenously injected bacilli. Heifers and bulls which become infected, I am inclined to believe, are not likely to be common elsewhere than in severely infected herds and in herds in which sanitation is treated as something of minor importance.

We may conclude here that no special measures for the protection of calves against Bang abortion disease are necessary, and, tentatively, that it is desirable to begin the protection of all bovine animals, and especially heifers, as they near the time of sexual maturity.

The mode of infection with the cow clearly does not seem to be through the act of copulation or at the time of conception. Abortion bacilli will not live in the non-pregnant uterus, and when they are introduced into it at the time of copulation and care is taken not to injure the mucosa they do not cause abortion disease, nor does the cow afterwards react with abortion tests; and I have no doubt that Professor Williams is right when he asserts that, once the uterine seal has formed, an effective barrier has been erected against the entrance of bacteria into the uterus via the vagina. The danger of infection through the udder I have already discussed, and this leaves open only two other modes of infection, namely, ingestion and inhalation. The latter seems doubtful to me, because the Bang bacillus is a delicate organism and would hardly survive the drying and exposure to light which it would have to undergo before it could be sustained in the air in a way that would lead to its inhalation in a virulent state. This leaves ingestion as the likely mode of infection, and experimental evidence proves conclusively that the ingestion of abortion bacilli by pregnant cows causes them to contract abortion disease and to abort. Hence, special precautions should be taken against the contamination of the food and drink of cows with anything that may contain abortion bacilli.

I believe that one of the errors into which etiologists have been prone to fall is the belief that the channels of infection for germ diseases are the orifices or openings of the body nearest to the regions most commonly and severely attacked, notwithstanding that it is well known that nearly all parasites, bacterial as well as those of higher order, have favorite habitats in or on the bodies of their hosts, which they manage to reach no matter at what point or through

what means they enter. But this is a large subject which does not happen to be on the program at this time.

The main object I have had in mind in preparing this paper has been to present the subject of Bang abortion disease in a hopeful light: I know that a hard fight is ahead before the plague can be eradicated, but it is not hopeless, and its hopefulness is becoming more apparent every day.

In conclusion I wish once more to emphasize the importance of maternity stables in the control of abortion disease. Such stables mean the separation of the infected cows from the environment in which the infection they spread abundantly at the time of parturition can do most harm, to an environment in which it is relatively harmless and in which it can be more easily and economically destroyed.

Dr. John I. Handley, formerly Assistant Professor of Veterinary Surgery and Clinic, Veterinary Department of Michigan Agricultural College, has just been discharged from the Army Veterinary Service. He entered the service September 4, 1917, as a second lieutenant assigned to the 41st Division. Immediately after his arrival overseas in April, 1918, he was assigned to the First Ammunition Train, First Division, and served continuously with that organization through the war and in the army of occupation. At the date of his discharge he held the rank of captain. Dr. Handley will locate in Atlanta, Ga., where he will be manager for the Southeastern Laboratories, Inc. Dr. Handley is a graduate of Alabama Polytechnic Institute, 1913; North Carolina State College, Bachelor of Science in Animal Husbandry, 1914, and North Carolina State College, Master of Science, 1916.

Semi-Weekly Farm News (November 28), in giving an account of an attempt to blow up a dipping vat, says: "It is agreed with practical unanimity that dipping the cattle is reducing the ravages of the cattle ticks, and the gain is so much greater than the loss that there is only sporadic opposition to the dipping vats. Science is working for the farmers and stock raisers more enthusiastically these days than in any other era since history's beginning."

"The National Department of Agriculture certainly has started something big and worth while in its Nation-wide campaign to promote the general use of purebred sires and to eliminate the scrub sire."—*Holstein-Friesian Register*, editorial.

BACTERIOLOGIC STUDIES OF A PERACUTE DISEASE OF HORSES AND MULES¹

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THE occurrence of a fatal disease in horses and mules at the Atlanta Stock Yards, Atlanta, Ga., was referred by Major R. M. Staley, veterinary inspector, Southeastern Department, to the Southeastern Department Laboratory, U. S. Army, for investigation. American Army horses and mules were not afflicted at this station, but the rapidly fatal character of an equine disease as observed in shipments belonging to private owners suggested the importance of ascertaining if possible the etiologic factor or factors concerned in the losses. Our investigations were started September 25, 1918, and continued as specimens from spontaneous occurrences of the disease were available. Specimens were not obtained during the preceding months of June, July and August, 1918, as comparatively few shipments of horses and mules are received at the Atlanta market during the summer months. Since mules are traded in large numbers at this point, the disease appeared more frequently in those animals than in horses.

According to the observations of Dr. William M. MacKellar, inspector in charge of the Bureau of Animal Industry, Atlanta, Ga., at least fifty cases involving a loss of approximately \$10,000 had occurred during the winter months of 1917-18, while losses during the shipping season of 1918-19 were even more frequent. Several shipments suffered a \$3,000 loss, and the total loss at this market approximated \$50,000.

The symptom-complex observed in afflicted animals resembled a peracute toxemia or septicemia-like infection. It was, however, not recognized as a specific entity by experienced persons. Information was therefore desired relative to the primary cause by attempting to eliminate or confirm the presence of known pathogenic microorganisms capable of producing death of horses and mules. Chemic poisoning was eliminated by the examinations of the stomach contents under the direction of the Chemistry Department of the Georgia School of Technology.

¹A report from the Veterinary Division, published by permission of the Surgeon General.

Preliminary to the bacteriological studies, the observations of Drs. MacKellar, Burkland, Boyce and Bahnsen (the latter State Veterinarian of Georgia) and Captain E. H. Stent of the British Royal Army Veterinary Corps, on over 100 clinical cases were carefully considered in order to ascertain more fully the influence of such factors as feed, age, condition of flesh, shipment, environment, etc., and thus to obtain the benefit of experienced counsel in the clinical disease from which certain pertinent facts were correlated as a basis of attacking the problem. An arrangement was completed with Dr. MacKellar whereby specimens from afflicted animals were delivered to the Department Laboratory, Fort McPherson, Ga., immediately following death. Later in the investigation the writers gathered specimens at the time the autopsies were performed.

OCCURRENCE

It was learned from the above-mentioned veterinarians that invariably symptoms of the disease developed subsequent to journey and often within 24 hours after unloading, suggesting the possibility of the fatal agent gaining entrance to the animal from infected cars, feed or water while en route, or a latent saprophytic intestinal infection invading the system incident to exposure in transit. The majority of animals showed symptoms in 48 hours following unloading, while a few cases were detected upon removal from the cars. The number of animals affected in a carload varied from 1 to 11 in the different shipments without respect to condition of flesh or age. In a December shipment, including 25 mules from Shelbyville, Ky., 11 deaths resulted on arrival at Atlanta within 36 hours after unloading. In another shipment of mules from Norlina, N. C., 6 deaths occurred within 48 hours after arrival at the Atlanta feeding pens. Three more animals of this group succumbed later.

Shipments where illness of this character occurred were, according to the records furnished by the railroad officials, unloaded and fed in accordance with the 28-hour law or as extended by consent of the owner. Available information of the source of several shipments wherein the disease developed, as well as the feeding points visited, gave no conclusive evidence of the origin of the infection, since numerous carloads were being handled at the same stations without ill effect.

The occurrence or extent of the disease at other markets has not been ascertained. Neither could comparisons be made upon the effect of placing feed in the cars in addition to or independent of feeding animals at local points during the journey. The British

Remount Commission operating in the United States had insisted that feed be placed in the cars to supplement the supply obtained at the unloading points. Among the thousands of animals which they had shipped over the American railroads, comparatively few losses resembling the disease under investigation occurred, yet it is not definitely known that the disease did not make an occasional inroad in animals purchased for England's Army.

TABLE 1.—*Date and origin of shipments wherein typical fatal cases were reported. Deaths occurred in Atlanta.*

Date	Died	Shipped from—
Dec. 1, '17, to Feb. 25, '18	Approximately 50 mules.	(Numerous points not recorded)
February 25, 1917.....	4 mules.....	Asheville, N. C.
March 6, 1918.....	3 mules.....	Columbia, Tenn.
September 25, 1918.....	3 mules.....	Unknown.
October 8, 1918.....	2 horses.....	Unknown.
October 12, 1918.....	4 mules.....	East St. Louis, Ill.
October 13, 1918.....	1 horse.....	East St. Louis, Ill.
October 20, 1918.....	1 horse.....	Unknown.
October 25, 1918.....	2 mules.....	Unknown.
November 6, 1918.....	2 mules.....	Unknown.
November 7, 1918.....	1 mule.....	Unknown.
December 3, 1918.....	1 mule.....	Elizabethtown, Ky.
December 3, 1918.....	1 horse.....	Elizabethtown, Ky.
December 3 to 8, 1918..	11 mules.....	Shelbyville, Ky.
December 16, 1918.....	1 mule.....	Bryan, Mo.
December 23, 1918.....	9 mules.....	Norlina, N. C.
December 30, 1918.....	4 mules.....	Bedford, Ind.
December 30, 1918.....	1 mule.....	Shelbyville, Ky.
January 2, 1919.....	2 mules.....	East St. Louis, Ill.
January 3, 1919.....	8 mules.....	East St. Louis, Ill.
January 5, 1919.....	1 mule.....	East St. Louis, Ill.
January 14, 1919.....	3 mules.....	Bedford, Ind.
January 14, 1919.....	1 mule.....	Gibsonville, Tenn.
January 18, 1919.....	1 mule.....	Kansas City, Mo.
January 20, 1919.....	1 mule.....	East St. Louis, Ill.
January 21, 1919.....	1 mule.....	Louisville, Ky.

NOTE—Animals shipped from East St. Louis, Ill., and Kentucky points were fed at Nashville, Tenn.

Animals shipped from small towns seemed to suffer a relatively high mortality, but horses and mules from the larger market centers were also afflicted. It is presumed that the shipments from smaller towns consisted of animals purchased in the immediate locality from which they were shipped. So far as could be discovered, the disease was incident to journey in all cases, but the definite relationship of feed, water, cars, loading chutes and feeding stations to which animals were exposed in shipment could not be ascertained.

SYMPTOMS

The clinical aspects of the disease, in the opinion of the writers and experienced observers, do not correspond with any known disease prevalent among equines.

The first noticeable symptoms of the disease consisted of partial loss of appetite and a sluggish, dejected appearance which, to the casual observer, might be regarded as a passing fatigue incident to journey. At this stage a careful clinical examination disclosed a discoloration of the mucous membranes and a pulse quite normal in rate but very weak in character, in fact a mere flutter. As the disease progressed the pulse became imperceptible. The mucous membranes were at first mildly hyperemic followed by varying degrees of cyanosis. A pronounced lingual involvement was designated "blue-tongue" by the laity, and this term is rather descriptive. Respirations were rapid, ranging from 40 to 45 per minute, with nostrils slightly distended. Muscular weakness in moving was noted, animals appearing restive and assuming decumbent positions for short periods of time. The organs of mastication and deglutition were apparently functioning normally, though the lower lip was usually pendulous. Animals would lap the water or wash the mouth continuously without swallowing, suggestive of dryness of the mucous membranes. Nervous manifestations observed before death were regarded as incident to a general intoxication. The temperature varied. In the initial stage of the disease it occasionally registered 105 F., but a temperature of 101 to 103 was more commonly observed. Increased languor and fatigue, plus a subnormal temperature, denoted approaching death. Animals commonly survived from 8 to 12 hours, though occasionally the duration of the disease was 24 to 36 hours. Rarely a few days intervened between the first noticeable symptoms and death. In most animals 2 or 3 hours preceding demise or during the death struggle there was a copious fetid liquid evacuation of the bowels. Diarrhea was a prominent symptom in cases less rapidly fatal. No evidence of pain could be detected by abdominal palpation. Recovery was not observed.

ANATOMICAL ALTERATIONS

The gross pathology in the organs and tissues, while strongly suggestive of the general character of the disease, could not be regarded as pathognomonic or suggestive of a particular etiologic factor. In several animals observed, the skin, subcutaneous tissue and musculature were normal, as were the lungs, pleurae, pericardium and thoracic lymph glands. The heart muscle was pale and showed a marked parenchymatous degeneration. The liver was flabby and showed passive congestion. The spleen in many instances was enlarged, soft and friable, punctate hemorrhages occasionally appearing beneath the capsule. The kidneys were friable, dark red in color,

and the capsule was easily removed. Body lymphatics appeared normal, while the mesenteric lymph glands were mildly enlarged and slightly injected.

It was reported by local veterinarians that some animals exhibited a hemorrhagic gastritis at autopsy, but the lesion was not consistent in the animals observed by the writers, and when present was very slight. A diffuse enteritis involving the lining of the cecum and colon was found in some cases, which was most marked at autopsy in animals which had been afflicted several days. The mucosa and submucosa of these organs were moderately infiltrated and diffusely discolored a scarlet red. The contents of the organs were fluid in character. Hemorrhagic areas and many small round necrotic erosions, varying in size from a pin-head to a pea, involved large areas of the lining. A plastic exudate adhered to these necrotic lesions. The latter was made clearly visible upon washing in water, and the inflammatory processes were accompanied by coagulation necrosis in diffuse areas.

Upon microscopic examination, following imbedding and staining, sections of involved cecum, the mucosa and submucosa showed extensive areas of edema and necrosis accompanied by hemorrhage. The morbid anatomy of the intestinal tract of animals showing areas of hemorrhagic and diphtheritic enteritis accompanied by coagulation necrosis was not to be observed in other fatal cases, though small patches of passive congestion and often a catarrhal inflammation was observed in the mucosa of the ileum, cecum and colon. The absence of macroscopical intestinal lesions in other animals suggested that fatality was not primarily associated with the gross pathologic alterations of the enteron, contributing to the possibility of a toxic poisoning or septicemia per se, which, if of intestinal origin, invaded the circulation without noticeable or marked local lesions.

OUTLINE OF INVESTIGATIONS

When practicable the procedure consisted in culturing the spleen, liver, kidney, heart blood, mesenteric lymphatics and intestinal contents of infected animals following death to ascertain the presence of bacteria of pathogenic significance. Pathogenes encountered and their relation to the spontaneous disease might then be interpreted by artificial transmission experiments. The examination of the specimens from spontaneous cases was attempted by the routine methods as follows:

a. Aerobic micro-organisms.—Agar in plates containing 5 per cent

human blood, plus one reaction to phenolphthalein, were smeared with the tissue from solid organs. Small bits of spleen the size of a pea were removed with sterile forceps after searing the capsule. Cotton swabs were also used to collect specimens for seeding purposes. Six plates of each specimen were often streaked with one piece of tissue to secure proper dilution of growth. Seeded plates were inverted and incubated at 37.5° C. Endo medium was similarly inoculated.

b. Anaerobic sporulating micro-organisms.—All media used for anaerobic cultures were boiled for 15 minutes and cooled quickly before inoculating. Cultures were made from the spleen and intestinal contents in tubes of dextrose broth, neutral in reaction, and covered to a depth of 2 cm. with neutral paraffin oil. Shake agar cultures containing 2 per cent dextrose of a similar reaction were also inoculated. Following inoculation anaerobic cultures were heated to 80° C. for 20 minutes and solidified by immediate cooling. Excluded from light, incubation followed at room temperature. Anaerobiasis was strengthened in shake agar cultures by adding a mixture of agar and glycerin, equal parts, to a depth of approximately 6 cm. in each tube. Both medium, after being inoculated, was placed in convenient containers and the air exhausted daily by a suction pump. Isolation of pure anaerobes was then carried out by the plate method of Dick,¹ substituting a glycerin agar mixture in place of the paraffin which was preferred in observing anaerobic colonies, in that it possessed the advantage of transparency which is not available in using paraffin.

c. Animal inoculations.—Spleen tissue from naturally afflicted animals, after being removed with aseptic precautions from beneath the capsule, was macerated in sterile saline solution with a mortar and pestle. One or two cubic centimeters of this suspension was inoculated subcutaneously into healthy rabbits. Cultural methods on rabbits following death were as described in *a* and *b*, though the heart blood, exudates and solid organs were cultured, omitting the intestinal contents.

Examination for pathogenic anaerobes proved negative, but to avoid overlooking such organism as *Bacillus botulinus*, which it seems may occur more frequently in animals than is generally conceded, naturally afflicted mules were treated with botulinus antitoxin, but with no success.

¹ References to literature at end of paper.

TABLE 2—Experimental Sero-Therapeutic Treatment Specific for Botulinus Intoxication

CASES	DATE	HOUR INOCULATED	AMOUNT INTRAVENOUSLY	CARDIAC STIMULANT	COMMENT
1. Horse	Dec. 3, 1918	1:30 p.m. 2:30 p.m. 3:30 p.m. 4:00 p.m.	100 c.c. 100 c.c. 100 c.c. 100 c.c.	45 c.c. camphorated oil subcutaneously every hour.	Increase in heart action and occasional colicky symptoms. Died 5:00 p.m.
2. Mule			None	None	Died 5:30 p.m.
3. Mule	Dec. 3, 1918	9:00 a.m. 10:00 a.m. 11:00 a.m. 12:00 a.m.	100 c.c. 100 c.c. 100 c.c.	Camphorated oil as above.	No change. No change. No change. Some distress. Died 1:00 p.m.
4. Mule	Dec. 3, 1918	9:00 a.m. 10:00 a.m. 11:00 a.m. 12:00 a.m.	100 c.c. 100 c.c. 100 c.c. 100 c.c.	Camphorated oil as above.	No change. No change. Some distress. Died 1:00 p.m.

Five animals similarly affected received other medical treatment without results. Death occurred in these animals at approximately the same time.

During the months of September, October, November and December, 1918, as well as January, 1919, specimens from 37 fatal cases were received for examination. It will be seen from Table 3 that in approximately 22 per cent of the cases the organism being considered was recovered. In a few instances other organisms of the paratyphoid type were encountered, but these were given little consideration due to their infrequency and lack of virulence.

MORPHOLOGIC AND BIOLOGIC CHARACTERISTICS

In stained preparations the organisms appear rod-shaped with rounded ends, 0.5 to 1.5 microns long and 0.2 micron wide. Direct from the tissues of affected animals a tendency to bipolar staining was observed. This characteristic was not noted in artificial cultures, though involution forms were frequent in old cultures. The organism stains readily with ordinary aniline dyes and is Gram negative. There were neither spores nor capsules. Motility was active and flagellæ were demonstrated by Smith's modification of Pitfield's method.³ "A saturated solution of bichlorid of mercury is boiled and poured while still hot into a bottle in which crystals of ammonia alum have been placed in quantity more than sufficient to saturate the fluid. The bottle is then shaken and allowed to cool. Ten cubic centimeters of this solution are added to 10 c.c. of freshly prepared tannic acid solution. To this add 5 c.c. carbol-fuchsin solution. Mix and filter."

In preparing films for staining, a small loopful of bacterial growth from an agar slant (24 hours) is transferred to about 20 c.c. of sterile distilled water and incubated for one hour at 37.5° C. (When inoculating the tube it should be held in a slanting position in order that the bacteria may be placed well down toward the bottom.) Thoroughly cleansed and sterile slides, free from grease, are employed. After incubating the suspension one hour, a loopful is carefully removed from the *top* and transferred to the slide, exercising care not to injure the organism. It is gently spread with a platinum wire, being careful not to touch the slide. It is then dried quickly, and is ready for the stain. It is a difficult procedure, and many failures result, however careful the technic.

"To stain, filter the above mordant directly upon the fixed preparation. Heat gently for three minutes, but do not allow to boil. Wash in water and stain with the following solution:

"Saturated alcoholic solution gentian violet..... 1 c.c.

"Saturated solution ammonia alum..... 10 c.c.

"Filter the stain directly upon the preparation and heat for three or four minutes. Wash in water, dry, and mount in balsam."

Growth occurred aerobically and it was found to be anaerobic. The growth upon agar plates containing 5 per cent human blood occurred in two forms, circumscribed colonies from light inoculations or an even growth spread along the line of inoculation with small budding colonies at the borders. The colonies varied in size from a pin-point to 0.5 cm. in diameter. The small colonies were round, convex and elevated, and when close together on the plate did not enlarge or become diffuse. Isolated colonies were larger, 5 mm. in diameter, round, convex, translucent, and of a distinct pearl gray or bluish tinge. After 48 hours' inoculation an opaque center is observed. The growth is glistening, opalescent, and is readily removed from slants, with salt or other solution, by rotation of the tube. Upon Russell's triple sugar medium (Andrade indicator plus lead acetate) a pink butt with gas formation and a lead sulphid reaction was noted, which reaction was indistinguishable from that of *Bacillus paratyphoid B*. Indol is not produced. Sugars including lactose, saccharose, maltose, mannite, dextrose, dextrin, xylose, arabinose, salicin and galactose (in Hiss serum water medium) were the only ones available for the determination of the physiological action of this organism upon carbohydrates. Tenbroeck⁴ suggests the use of inosite to differentiate *Bacillus enteritidis* (Gärtner) and *B. paratyphoid B* culturally, but as it was impossible to procure this sugar it could not be tried. It is stated that medium containing this sugar is fermented by *B. paratyphoid B*. The few slight discrepancies appearing in the tables may have been due to the "war" quality of the sugars employed. For instance, *B. paratyphoid B* failed to alter medium containing dextrin.

Gelatin stab cultures showed a grayish, round, translucent colony about 0.5 cm. in diameter on the surface at the point of inoculation. After 48 hours, along the line of stab a faint beaded growth developed which was followed by the formation of a few lenticular colonies. The gelatin was not liquefied. There was a very thin discrete grayish line of growth after streaking the surface of a gelatin plate. Three days later the growth became wrinkled and opaque in character. Small colonies along the line of streak do not thrive nor are they characteristic. The growth on agar slants is heaviest at the base of the slant. Along the streak the growth is grayish and opalescent. On dextrose and glycerin agar slants the growth is similar to that on plain agar slants but more luxuriant. On

Loeffler's blood serum, Dorset's egg medium and Petroff's egg medium growth is not characteristic and spreads over the surface in a thin whitish film.

Beef extract broth (salt free) containing glycerin showed an even cloudiness in 12 to 18 hours. No color reaction was noted on the endo medium, while the character of the growth was similar to that upon blood agar, though not as luxuriant. The colonies were less opalescent and an amber color to transmitted light was noted.

In litmus milk slight acidity, then alkalinity, was noted during the first three days of incubation, but later a marked alkalinity was observed.

Thermal death point.—Due to the variable and unsatisfactory results gained from the use of 15-mm. tubes in determining this factor, 8-mm. glass tubing was employed. Cut in 7-inch lengths, one end was sealed by flaming, the other plugged with cotton, sterilized, partially filled with bouillon and autoclaved for 45 minutes at 15 pounds pressure. It was then incubated for 48 hours to insure sterility. These tubes were inoculated with Gärtner's bacillus and incubated for 24 hours, after which they were sealed at the open end by flaming and totally immersed in a bath registering 60° C., the tubes being removed after varying intervals from one-half to 60 minutes. All cultures heated for three minutes or more showed no growth upon being transplanted. A series of cultures heated at 55° C. demonstrated that 5 minutes at this temperature was required for the destruction of the organism.

Destruction by disinfectants.—Tubes of broth were treated with 5 per cent phenol to make dilutions varying from 1-100 to 1-5,000 of a bacterial suspension. Two-tenths of a cubic centimeter of the culture at a density used for agglutinatings was added to each tube. These were incubated for 24 hours, then cultured, the dilution of 1-500 prohibiting growth while that of 1-560 was not sufficient to destroy. When treated with freshly prepared Dakin's solution, growth occurred in dilutions of 1-1,000 but was negative at 1-400. In testing out tricresol 1-200 was found to kill while 1-400 did not.

In our investigations 229 specimens from equine feces, water and feed troughs were gathered to obtain data on the prevalence of this organism in the excrement and intestinal tract of healthy horses as well as in nature. Thirty-one samples of equine feces were examined which had been obtained from the Quartermaster's stables at Fort McPherson, Ga., while the remaining samples were taken from the stables, corrals and feeding pens belonging to

private owners at the Atlanta Mule Market. Samples were also gathered from the loading chutes and uncleared stock cars at the Atlanta Stock Yards where the disease under investigation occurred sporadically. Specimens of dejecta were gathered on sterile swabs and planted on endo medium, each sample being numbered with an index as to its origin. Not over one hour elapsed between the time of gathering until plates were seeded and placed in the incubator. Suspicious colonies were picked and transferred to Russell's triple sugar medium for identification. Cultures from this medium were examined in stained films by Gram's method or were planted in broth, returned to plates of endo for repicking, or transferred directly from Russell's medium to Hiss's serum-water medium containing the various sugars, for further identification.

Through a process of elimination, by the use of endo, Russell's medium and Hiss's serum-water medium, 14 cultures of paratyphoid-like types were encountered. (See Table 16 under "Cultural Characteristics.")

GARTNER INFECTION IN ANIMALS

Mohler⁵ records the presence of *Bacillus enteritidis* (Gärtner) in bovines suffering from fatal enteric disturbances, while Meyer, Traum and Roadhouse⁶ have confirmed this observation more recently. *B. enteritidis* was also observed by Jensen in fatal enteric calf diseases. The occurrence of this organism in the intestinal disturbances of calves was, however, considered as secondary to *B. paracolon* and other true colon-like species, particularly virulent strains of *B. coli communis*. The strains of *B. paracolon* and *B. paratyphoid* B of this laboratory, while indistinguishable morphologically and culturally, may be clearly differentiated by serological tests. (See Tables 7 and 9.)

GARTNER INFECTION IN MAN.⁸

Of special interest is the food epidemic which occurred in Frankenhäusen in 1888. The source of infection was a cow slaughtered on account of severe enteritis. Fifty-seven persons became ill from eating of the meat. Some ate it raw, some had it boiled or roasted, three partook only of the broth. The symptoms were those of a severe gastro-enteritis followed by desquamation. Only one person, who had eaten of the raw meat, died. He was nursed by his mother, who later developed the same symptoms, probably as a result of infection from the discharges. Gärtner cultivated from the spleen

of the fatal case, also from the flesh and intestines of the cow, an organism he named *Bacillus enteritidis*.

In the following year Gärtner found a similar organism in another outbreak of food poisoning at Cotta, near Dresden. The meat, in this case, came from a cow suffering from an inflamed udder. There were 136 persons affected, and of those 4 died; apparently all had partaken of raw meat. Cultures were obtained from the cow and from the bodies of 2 of the persons who had died, and, though they resembled *B. enteritidis* morphologically, they differed in being non-poisonous. Moreover, the flesh of the cow lost its poisonous property when cooked.

Van Ermengem in 1891 obtained from an outbreak at Morseele, Belgium, a typical *B. enteritidis*. In this outbreak 80 persons were affected, 4 of whom died. The flesh was derived from 2 calves which had a severe enteritis; one died and the other was slaughtered. The meat was eaten in a boiled or roasted state, though the isolation of the organism from the internal organs of one of the dead would indicate that part of it had not been sufficiently sterilized. An identical organism was obtained from the bone-marrow of one of the calves. Feeding or injection of mice, rabbits, guinea pigs and calves produced severe and fatal infection. A monkey developed typical cholera nostras, but recovered. Van Ermengem held that it was the same as the enteritidis bacillus of Gärtner, a view which has been confirmed by the subsequent studies on agglutination.

In 1892 Fischer obtained an apparently true *B. enteritidis* from a food poisoning at Rumsfleth. The same organism was obtained by him from meat which caused poisoning at Haustedt in 1905. The following year he met with the same organism in the spleen of a cow suffering with an infected udder.

Van Ermengem studied a case of poisoning in Ghent in 1895. A sausage made of pork and beef was examined by an inspector who, on account of its fresh appearance, pronounced it unobjectionable. He himself ate the raw sausage and others followed his example. They all became sick and the inspector died in five days. The animals furnishing the meat were not known to be sick. Cultures from the sausage demonstrated the presence of *B. enteritidis*.

In 1896, at Posen, cultures were obtained from a fatal case by Gunther. The bacillus differed from Gärtner's bacillus in minor points.

In England the first application of the agglutination test in the study of these organisms was made in 1898 by Durham, who had

occasion to investigate four outbreaks of gastro-enteritis. In the first of these, at Hatton, 185 persons were affected, but the cause was not traced to meats of diseased animals. From the liver of a fatal case he obtained a bacillus which was agglutinated by sera of the sick in varying dilutions, in some as high as 1-1,000. The sera also agglutinated the typhoid bacillus to some extent. The Gunther bacillus and another from Vienna were agglutinated about the same as typhoid, but *B. enteritidis* was not clumped except in fairly high concentrations. By making these tests on different organisms Durham was able to show that the epidemic was associated with and probably due to a variety of *B. enteritidis*. In three other outbreaks studied by him the organism was not isolated, but from the behavior of the sera of sick to various bacteria it was made clear that the cause was essentially the same, i. e., a variety of the enteritidis bacillus.

In the Derby outbreak, 1902, the cause was traced to the eating of pork pies. About 210 persons became ill and there were at least 4 deaths. From the organs and intestines of victims Délépine isolated *B. enteritidis derbiensis*.

In Neunkirchen, 1903, another case of food poisoning occurred. Over 30 persons developed a gastro-enteritis and 3 died. From horse flesh which was used as food and from organs of two of the fatal cases Drigalski isolated a bacillus which was agglutinated by the serum of infected persons. This serum would likewise agglutinate *B. enteritidis* equally as well, and to a lesser degree *B. typhosus* and *B. paratyphosus*. Boiled cultures proved fatal to animals.

Osler further states that "it would appear that paratyphoid infections are essentially the same in kind as the typical meat infections," which, of course, would include *B. enteritidis*, and would correspond with the result gotten by the writer when feeding both *B. enteritidis* and *B. paratyphoid B* to horses. Both animals died after showing the typical picture of the spontaneous disease; clinically they could not be separated.

Edelmann^o in his work on Meat Hygiene says:

"The character of the disease developed in this manner in man varies extraordinarily. According to van Ermengem, the symptoms in general show an *acute course* and develop as an attack of cholera, cholera nostras, or an inflammatory gastro-enteritis (febris gastrica), sometimes accompanied by *muscular weakness* and *ataxia*. Frequently the symptoms can be hardly distinguished from a *gastro-intestinal catarrh*. Mortality hardly exceeds 2 to 5 per

cent. According to recent observations, cases of so-called paratyphus belong within the sphere of action of the *Bacillus enteritidis*."

According to Stitt,¹⁰ it has been noted that the bacteria (Gärtner) or their toxins may be distributed unevenly in the meat eaten, so that one person consuming the same meat may be made very ill while others eating this meat may escape infection. Infection of food may occur from the material carried by flies, or *even from the feces of mice and rats* deposited on foodstuffs. This organism (Gärtner) is very pathogenic for laboratory animals, producing a hemorrhagic enteritis and *at times a septicemia*.

Buchanan¹¹ points out that in man the disease may be diagnosed by the agglutination test, although with difficulty, for the various strains agglutinate differently, and blood from a typhoid or paratyphoid patient may show a marked capacity to agglutinate *B. enteritidis*.

It should be noted, he says, that various types of the paratyphoid bacillus are very similar to this form, if not identical, and doubtless are the cause of meat poisoning as well.

Speaking of the bacillus of Gärtner, Park and Williams⁷ state that "in experimental animals immunity is produced by feeding and by injection. Immunity is produced not only against the homologous strain but, as a rule, also against related strains."

(To be continued.)

Kansas Farmer (November 29) says editorially under the heading "Banish the Scrub Sire": "If half the effort had been spent in pushing for the universal use of the purebred sire that has been exerted in setting up new inexperienced men as breeders of purebred live stock, the general run of our market stock would rank much higher than it does. Breeders of purebred live stock would do well to line up with the Nation-wide program of boosting for an increased use of purebred sires in live-stock production."

Dr. John F. Winchester, with his wife and daughter, stopped off at Washington en route from New Orleans. They visited the Bureau laboratories and became deeply interested in the work which is being conducted on bovine tuberculosis.

Dr. and Mrs. N. S. Mayo, accompanied by Dr. and Mrs. H. R. Ryder, spent a fortnight after the New Orleans meeting in visiting Cuba.

STUDIES ON ANTHELMINTICS

VII. A comparison of castor oil and other purgatives in connection with the administration of some anthelmintics

By MAURICE C. HALL, Ph. D., D. V. M.,¹ and MEYER WIGDOR, M. A.,
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THE question as to the best purgative for use in connection with the administration of oil of chenopodium is an unsettled one, but the two drugs most used are castor oil and magnesium sulphate or Epsom salts.

The Third Annual Report of the Rockefeller Foundation, dated January, 1917, says (p. 191), in regard to hookworm work in Trinidad: "It was necessary to use magnesium sulphate instead of castor oil, because in Trinidad there is an exceedingly strong local prejudice against the latter and it is practically impossible to induce persons of the lower class to take it." Darling, Barber and Hacker (1918) state: "We divided the squads of men into halves. Those on one side of the ward were given magnesium sulphate; those on the other side were given castor oil. The castor oil squad always showed the greater number of cases of dizziness and deafness; most of the cases of inability to rise and walk occurred in this group. The urine of patients taking castor oil contained much heavier precipitates when tested for oleoresin than those that had taken magnesium sulphate. Dizziness and muscular incoordination were less with magnesium sulphate than with castor oil, compound mixture of senna or calomel." [In this connection, it is worth noting that Dr. David E. Buckingham, of Washington, D. C., has called the attention of one of us (Hall) to cases in his practice where deafness in dogs has followed the use of chenopodium with a delay of 12 hours or so in administering castor oil.]

On the other hand, the Third Annual Report of the Rockefeller Foundation, quoted above, notes (p. 193) the following case: "The most serious mishap was collapse in a child of three, on whom the second dose of magnesium sulphate had no effect. She recovered after a dose of castor oil." Heiser (1917) reports the death of 2 children in Ceylon, where magnesium sulphate was used, and in

¹ Resigned March 27, 1919.

comparing the results here with results in Sumatra, where there were no deaths in 300,000 treatments with chenopodium, he notes these differences in mode of administration: In Sumatra there were no dietary restrictions, no preliminary purgation, castor oil was used instead of magnesium sulphate, and the chenopodium was given in hard capsules. By way of comment, we may say that lack of dietary restrictions probably adds to a patient's safety, as a rule, but also commonly diminishes the anthelmintic efficacy; preliminary purgation has been abandoned by us as a routine procedure, as it seems to be unnecessary; of the 2 deaths cited by Heiser, 1 was a case where soft capsules were used, and 1 a case where no capsules of any sort were used; and the use of magnesium sulphate in the cases which died is apparently the only difference of importance. At that, there is the possibility of idiosyncratic intolerance to chenopodium or the presence of contraindications to the use of chenopodium in the cases where deaths occurred.

Fixed oils have been found of value in preventing chenopodium poisoning by Salant and Nelson (1915). Hall and Foster (1917, 1918) had excellent results with castor oil. In our experience—and we have here the data on 220 dogs which have been treated with chenopodium—the simultaneous administration of an ounce or two of castor oil with chenopodium gives very excellent results—good purgation and a high degree of protection against the gastro-intestinal irritation and the toxic effects. Some experiments indicating the protective action of castor oil in cases where double the minimum lethal dose had been given were published by Hall (1918) in Hall and Hamilton's (1918) paper on constituents of chenopodium. Those experiments showed the following results where 4 dogs were given 1.0 m. p. k. (mil per kilo) of chenopodium or a distillation product of chenopodium: One dog was given 15 mils of castor oil before treatment, 15 mils more with a chenopodium constituent, and 30 mils after the chenopodium, and was killed the sixth day after treatment. That the castor oil is protective, and not merely purgative, is shown by the fact that this dog passed no feces the first day after its treatment with double the lethal dose. A second dog was given chenopodium with the same amounts of castor oil in the same way, and was killed the sixth day after treatment. The protective action of the castor oil is again shown here by the fact that the dog passed no feces the first two days after treatment; the animal was then given another dose of 30 mils of castor oil. The other 2 dogs received the same amounts of chenopodium or chenopodium con-

stituent in 50 mils of liquid petrolatum, and died the day after treatment or the following day. A number of experiments show that liquid petrolatum diminishes the anthelmintic efficacy of oil of chenopodium and furnishes inadequate protection against toxic effects.

The protective action of castor oil against the toxic effects of oleoresin of male fern have been pointed out in another paper by Hall (1918). Of 5 dogs receiving 20 mils of oleoresin of male fern, a lethal dose, 1 dog received no purgative and died the sixth night after treatment; 2 received 60 mils of castor oil and were killed the sixth and eighth days after treatment; 1 received 30 mils of castor oil and was killed the eighth day after treatment; 1 received 6 grains of calomel and was killed the ninth day after treatment. To these records we may add the case of dog No. 180, a bulldog weighing 9 kilos, which received 20 mils of oleoresin of male fern and 6 grains of calomel, and was killed 8 days afterward. The dogs that were killed had recovered from the treatment and were in good physical condition. These experiments show that one essential in the administration of male fern is purgation. So far from castor oil increasing the absorption of male fern and making it more dangerous, it will save animals that have been given a lethal dose, as will calomel.

In the same paper, Hall (1918) notes that a little more than the lethal dose of 0.5 m. p. k of chenopodium, administered to a dog with an accompanying 100 mils of olive oil, and followed by 50 mils more $2\frac{1}{2}$ hours later, resulted fatally in less than 24 hours. A number of other experiments with sub-lethal doses shows that olive oil administered with oil of chenopodium affords little protection from toxic effects, hastens gastric absorption, and delays the passage of the drug from the stomach, with the resultant production of severe gastric lesions.

In the following experiments each of 4 dogs was given a lethal dose of 0.6 m. p. k. of oil of chenopodium. One hour later 2 dogs were each given 60 mils of castor oil and 2 dogs were each given 15 grams of magnesium sulphate. The results were as follows:

Dog No. 287, a hound weighing 9.5 kilos, showed chenopodium poisoning about 15 minutes after treatment. The chenopodium was given in hard gelatine capsules. Dog staggered and slobbered profusely. Within a half hour the animal had vomited and was lying down in its cage with feet outstretched. An hour after treatment an attempt was made to administer the magnesium sulphate, but

the animal was in no condition to swallow properly and a considerable part of the salts never reached the stomach. The dog was found dead the next morning. This can not be regarded as a test of magnesium sulphate, as conditions were unfavorable. The dog was a poor subject for treatment; the temperature was 102° F. before treatment, and the conjunctiva was inflamed, indicating distemper, and this was confirmed by postmortem examination. Anthelmintics are contraindicated in distemper and other febrile conditions, even when given in therapeutic doses.

Dog No. 282, a spaniel weighing 11 kilos, was given the chenopodium in hard gelatine capsules. The dog showed no immediate effects, but in a half hour it was staggering and slobbering. An hour after treatment it was lying down, unable to keep on its feet. It received the castor oil, and again lay down, setting its teeth in the wires of its cage. The next morning the dog was found dead; 60 mls of castor oil could not save this animal 1 hour after the administration of 0.6 m. p.k. of chenopodium.

Dog No. 284, a bull terrier weighing 9 kilos, was given the chenopodium without the use of capsules and lost over half of it. About a half hour after dosing, the dog vomited. At this time the dog was standing up and yelping noisily. An hour after dosing, the dog was staggering, and the magnesium sulphate was given at this time. The next morning the dog was lying on its side trembling. At 1:00 p. m. the dog was apparently unconscious, barking at intervals and moving the legs automatically and rather rapidly; temperature 96.3° F. At 2:00 p. m. the bark had changed to a whine. At 2:35 the dog was lying on its side, moving the legs in a swimming stroke, and stopping and whining at intervals; temperature 97.4° F. The second day after treatment the dog was lying in its cage unconscious, kicking very feebly and breathing very slowly. Temperature, 94 at 8:00 a. m.; 94.2 at 11:00 a. m.; 94 at 4:00 p. m. The dog was not seen the next day (Sunday), but was found dead the following day. The magnesium sulphate could not save this animal one hour after a dose of 0.6 m. p. k of oil of chenopodium. The dog was a young and active subject, but the eyes contained purulent matter before treatment, and the lungs showed a purulent bronchitis on postmortem; the temperature before treatment was only 100.4° F., however.

Dog No. 286, a terrier weighing 8.5 kilos, was in good physical condition an hour after the chenopodium treatment; it had vomited and was trembling, but was still active. Gave castor oil. Tempera-

ture 101 before treatment. The next morning the dog was sitting down and seemed drowsy; in the afternoon, the dog was standing, not trembling, and the temperature was still 101. The following day, the dog was standing up, but trembling and had not yet eaten. The dog was not seen the third day after treatment (Sunday), but on the fourth day the dog had eaten and was in good condition. The dog was killed 18 days after treatment. The digestive tract was normal. The castor oil saved the life of this dog. Possibly the absorption of chenopodium was slow for some reason, as it seemed to be, so that the castor oil was in ample time to exert its protective action.

Unfortunately, the above experiments do not give definite results on which to make a choice between castor oil and magnesium sulphate, and it is possible that no choice need be made. However, the experiments show that even after the lapse of an hour, following the ingestion of 0.6 m. p. k of oil of chenopodium, which is more than the m. l. d., 60 mls of castor oil will save a dog's life at times and will fail to save it at times. No conclusions may be drawn from the experiment with dog No. 287; it confirms the conclusion that anthelmintics should not be given to animals with distemper. Dog No. 284 got less than a lethal dose of chenopodium, received the magnesium sulphate, and died, probably on the third day; but this dog was not in the best physical condition. The experiments, then, throw no light on the protective value of magnesium sulphate, but do confirm the value put on castor oil for use with chenopodium.

SUMMARY

Experiments published in this paper and elsewhere show: That castor oil is highly satisfactory as a purgative after oil of chenopodium, not only by virtue of its purgative properties, but by virtue of a protective action aside from this. It will save the lives of animals receiving lethal doses of oil of chenopodium, when administered with the drug or an hour later, and will save animals given lethal doses of oleoresin of male fern when given with the drug. Calomel will also save animals when given with lethal doses of male fern. Liquid petrolatum affords but little protection against lethal doses of chenopodium and diminishes the anthelmintic efficacy. Olive oil retards the passage of chenopodium from the stomach and increases gastric absorption; it does not protect against lethal doses. Some medical men prefer magnesium sulphate to castor oil; our

data on this point are inadequate. Magnesium sulphate is not well suited to dog practice.

BIBLIOGRAPHY

Darling, Samuel T.; M. A. Barber; and H. P. Hacker. 1918. The treatment of hookworm infection. *J. Am. M. Assn.*, v. 70, Feb. 23, pp. 499-507.

Hall, Maurice C. 1918. A discussion of some principles of anthelmintic medication. *N. Orleans M. & Surg. J.*, v. 70 (8), Feb. pp. 637-653.

1918. The anthelmintic value of chenopodium components. *In* Hall and Hamilton (1918), pp. 240-261.

Hall, Maurice C.; and Winthrop D. Foster. 1917. Oil of chenopodium and chloroform as anthelmintics. Preliminary note. *J. Am. M. Assn.*, v. 68 (26), June 30, pp. 1961-1963.

1918. Efficacy of some anthelmintics. *J. Agric. Research*, v. 12 (7), Feb. 18, pp. 397-447, 1 fig.

Hall, Maurice C.; and Herbert C. Hamilton. 1918. Investigations on the composition of oil of chenopodium and the anthelmintic value of some of its components. *J. Pharm. & Exp. Therap.*, v. 11 (3), Apr., pp. 231-261.

Heiser, Victor G. 1917. The administration of chenopodium. *Military Surg.*, v. 41 (2), Aug., pp. 353-354.

Salant, William; and E. K. Nelson. 1915. The toxicity of oil of chenopodium. *Am. J. Physiol.*, v. 36 (4), March, pp. 440-463.

Dr. E. L. Bertram, who for the last five years has been in charge of the Bureau of Animal Industry work of meat inspection at National Stock Yards, East St. Louis, Ill., has resigned from the Bureau to accept a position with the E. Kahn Sons Company, Cincinnati, Ohio, at a salary considerably in excess of that paid to him by the Government. Dr. Bertram entered the Bureau in 1899.

Drs. U. G. Houck and J. R. Mohler returned from New Orleans by way of the Government Experimental Farm at New Iberia, La., and later inspected the offices of the Bureau of Animal Industry at Baton Rouge, La., and Jackson, Miss.

The year 1919 is the centennial anniversary of the introduction of the stethoscope into practical medicine by René Laennec of France.

CATARRHAL VAGINITIS IN THE DOG

By OSCAR SCHRECK,

New Haven, Conn.

SYNONYM.—Leucorrhea.

DEFINITION.—It is a subacute or chronic inflammation of the mucous membrane of the vagina, and may extend to the walls of the uterus.

ETIOLOGY.—In some cases it may be caused by the sequel of distemper, or inflammation of the mucous membrane, the result of coition, polypus, morbid growths, or catarrhal conditions, and difficult parturition. It is not a common disease in the small animals, and the few cases seen by the writer were caused by difficult parturition and catarrhal conditions. Still in some cases it may be due to violence at the time of serving or to local violence, as by inserting foreign substance into the vagina.

SYMPTOMS.—In the acute form the lips of the vulva are swollen, sensitive and injected and of a violet-red color on the internal surfaces. The disease is characterized by a whitish discharge from the vagina, and is accompanied by severe itching, the animal biting the parts more or less, to the great annoyance of the animal and owner. The general health of the animal suffers and the appetite fails. In some cases there is excessive debility. In the catarrhal condition the nose and eyes may also be congested. The animal will also be observed in some cases to drag the kind parts on the ground. As the disease advances the discharge becomes mucopurulent. Micturition and defecation are painful and difficult and the animal will change from place to place, trying to comply with the laws of nature, it is at this time that the discharge will be more noticeable. In the chronic stage the drain on the system leads to more or less weakness of the animal. In the chronic form, the mucous membrane may be thickened and rough or it may become relaxed and prolapsed.

TREATMENT.—The treatment must be both constitutional and local. Laxative food is very beneficial; in fact the bowels should work freely and without the straining generally seen in the dog. On this point I put a great deal of reliance and it is worthy of a great deal of attention in treating this disease. Alteratives and

tonics are indicated. The following case report will outline the best and most worthy line of treatment that is used by me.

CASE REPORT.—The animal, a Russian wolfhound, female, age 2 years; condition at the time of examination poor; temperature 102° F. There was also a loss of appetite, weak pulse, debility, with a vaginal discharge of milky, sticky fluid. The animal had been sick between 3 and 4 weeks before I was called. The eyes showed some conjunctivitis, the left eye being somewhat closed with mucous secretion; also a catarrhal condition of the nasal mucosa. The animal would draw herself along on her hind parts every little while and would lick and bite the vulva to the great annoyance of the owner. On examination the following was noted. Lips of vulva swollen and somewhat sensitive; the wall of the vagina of a violet red color; on the floor of the vagina was a muco-milky secretion, acid in reaction; the animal was not pregnant, nor in the period of estrum. I eliminated the possibility of the discharge being of a local nature. I also discarded the idea of uterine disease, or cancer of the uterus, for in cancer we have a peculiar persistent fetor of the discharge which is characteristic. This was not in evidence. I also discarded polypi, for in the latter the discharge is most often mixed with blood, which was not in evidence. I therefore made my diagnosis of catarrhal vaginitis, and the following treatment was given:

Salol	gr. XXXV
Olii resin cubebs.....	dr. I
Balsam capaba (para).....	dr. II
Pepsin	gr. XV
Misc. et fiat caps.....	XV
Sig. One capsule t. i. d.	

I also ordered an injection of 1-1,000 solution of pyoktanin twice daily. The only objection to this latter treatment is the stain, but this is easily removed if the external parts are washed after each injection before drying. The solution must be made fresh at the time of using.

The treatment was continued until the discharge stopped. The dog is now a very much changed animal, and the owner is well pleased.

ABSTRACTS

VACCINATION OF HERBIVORA AGAINST RABIES BY MEANS OF "ETHER-VIRUS." P. Remlinger. In *Bul. Acad. Méd., Paris*, July 8, 1919, vol. 82, p. 47-49. Abstract in *Bul. Inst. Pasteur, Rev. et Anal.*, Sept. 15, 1919, vol. 17, no. 17, p. 575, 576.

Goats were used in the experiments. The animals were injected in the muscles of the neck with 20 c. c. of a 1 to 50 emulsion of street virus capable of killing rabbits in 14 days. They were then separated into two lots, one serving for controls and the other subjected to vaccination. From 48 to 96 hours after inoculation with street virus the vaccinated animals received subcutaneously the entire emulsion (in 150 c. c. of water) of a fixed virus rabbit brain which had been left in ether for 72 hours. The checks succumbed to rabies on the twenty-third to sixty-eighth day after inoculation, while those vaccinated resisted the infection. These results, in all probability, can be obtained with cattle and horses, and it seems that hereafter it will be possible to vaccinate the latter by injecting them two or three times subcutaneously with two or three fixed-virus rabbit brains which have remained in ether for 70 to 75 hours.

L. T. G.

AUTO-VACCINO-TOXINOTHERAPY IN APHTHOUS FEVER. G. Finzi. In *Nuovo Ercolani*, 1919, no. 3. Abstract by L. Panisset in *Bul. Inst. Pasteur, Rev. et Anal.*, Sept. 15, 1919, vol. 17, no. 17, p. 577.

During a serious epizootic of aphthous fever occurring in Italy, the author highly recommended the following manner of treatment: In an affected animal during the febrile period, blood is drawn from the jugular and immediately injected subcutaneously into the same animal (150 c. c. in adults, 50 to 75 c. c. in heifers and young steers, 20 to 25 c. c. in calves). The blood contains toxins and aphthous antigens, but its injection brings neither new virus nor added toxin to the treated animal. In animals which on account of previous attacks show only a slight or mild form of the disease, in spite of the increased virulence of the virus, the injection furnishes, in addition to the antibodies of the plasma and the formed elements of the blood, an abundance of toxins and aphthous antigens. In young animals the treatment is accompanied by a thermic and a general reaction; improvement follows these reactions.

The method can be recommended in centers of serious outbreaks of apthous fever; its use arrests the mortality and hastens recovery in those treated. The operation is simple, since each animal furnishes its own treatment.

L. T. G.

THE NATURE OF THE REACTION TO MALLEIN AND THE HEREDITARY TRANSMISSION OF ANTI-GLANDERS BODIES. E. Bertetti and F. Finzi. In *Rend. R. Accad. Lincei*, Dec., 1918, vol. 27. Abstract by L. Panisset in *Bul. Inst. Pasteur, Rev. et Anal.*, Sept. 15, 1919, vol. 17, no. 17, p. 557, 558.

Finzi, after his studies on mallein sensitization, has been able to affirm that the glandered horse reacts to mallein not only by producing specific antibodies, but also on account of a particular form of sensitization peculiar to glanders infection. Mallein should be considered as a substance containing a special toxin which, when arriving in the sensitized organism, constitutes a poison only for the animal affected with glanders. In denying that the reaction to mallein should be an anaphylactic manifestation, the authors consider that it is the result of a phenomenon of immunity.

Recent studies have confirmed Finzi in his first opinion. These have shown that if the reaction to mallein was connected with the presence of antibodies, it should exist in the animals hyperimmunized for the purpose of furnishing serums rich in antibodies; but the reaction is always wanting in these animals.

The study of the hereditary transmission of glanders antibodies brings new arguments in favor of the idea sustained by the author on the pathogenesis of the mallein reaction. Ten foals born of dams affected with glanders or in the course of hyperimmunization furnished an agglutinating serum and positive tests to complement deviation, but none of them furnished a reaction to mallein. If there is proof that the glanders antibodies pass through the placental membrane¹ (the foals having been found protected), the results obtained show clearly that the existence of antibodies does not suffice to explain the reaction to mallein.

L. T. G.

¹In the United States, Schoening has shown that foals from dourine-infected dams lose their reaction to the complement-fixation test after several months, indicating that transmitted immunity is only transitory.

EXPERIMENTAL STUDY OF THE THERAPY OF TUBERCULOSIS. G. Volpino. In *Ann. Inst. Pasteur*, 1919, vol. 33, p. 191-196.

The experimenter noticed that guinea pigs inoculated with extracts of tuberculous materials containing xylol did not become so severely infected as control guinea pigs inoculated with similar extracts containing no xylol.

Twelve guinea pigs were used in an experiment as follows: All were inoculated with portions of the same sputum moderately rich in tubercle bacilli. Sputum was ground in a mortar with 15 volumes of sterile water. Each animal received $\frac{1}{4}$ c. c. in the internal face of the thigh.

Four days after infection the injection of xylol was begun on 6 animals, the other 6 remaining as controls. Dose, $\frac{1}{2}$ c. c. xylol subcutaneously, over the abdomen. Local edema followed. The injections were repeated every 2 to 4 days, waiting longer if necessitated by extended infiltration.

Both antemortem and postmortem examinations of the animals showed, 46 days after infection, that the control animals had become much more severely infected than the animals receiving xylol.

In summarizing: It is found that with guinea pigs not too heavily infected, if treatment is begun 8 to 10 days after infection, they may be kept up to the fortieth day without manifesting anything other than signs of limited infection; whereas the control animals, beginning with the fifteenth to eighteenth day, show easily visible external alterations as well as extensive internal invasion. In order to obtain this result it is necessary to inject xylol as often as possible, in robust animals from $\frac{1}{2}$ to 1 c. c. daily for 15 days.

Xylol is only slightly toxic to animals; rabbits were not killed by 4 to 6 c. c. injected subcutaneously; 600-gram guinea pigs tolerated 1 to 2 c. c. doses; sheep, 3 c. c. Prolonged treatment results in pronounced alterations of the skin; this makes it difficult to keep up the treatment until a complete cure is effected.

The mechanism by which xylol (and other hydrocarbons) exerts its antituberculous action seems to consist in large part in its stimulating effect on the phagocytic apparatus of the animal. In fact in preparations from tuberculous treated animals one finds that most of the bacilli have been ingested by phagocytes.

Tuberculous human subjects were improved by intramuscular injections of $\frac{1}{2}$ to 1 c. c. xylol, although there were intense local reactions with fever and pain. This necessitated the abandonment

of this method of injection. Instead, the hydrocarbon was dissolved in sterile olive oil. Ten per cent solutions were well tolerated; 1 c. c. could be injected daily. Gradually, 20 per cent solutions could be injected without provoking dangerous reactions.

W. N. B.

INTESTINAL INFECTION OF MAN CAUSED BY FOWL-CHOLERA BACILLUS.

Von Boer. In Zentbl. Bakt. Orig., vol. 79, p. 390.

The author describes a case of acute gastro-intestinal infection in a 32-year-old Russian prisoner of war, caused by *Bacillus avisepticus*. The bacteria could be isolated from the feces, but not from the blood. Recovery occurred after 6 days.

W. N. B.

THE INTRAVENOUS INJECTION OF TINCTURE OF OPIUM. Taskin. In Bul. Soc. Cent. Méd. Vét., April 3, 1919, p. 139-141.

As a result of the uncertain effect of opium administered by the mouth, the author tried tincture of opium intravenously in a number of cases of colic in the horse. He found that small doses (10 to 30 c. c.) produced a sedative effect, slightly superior to that produced by morphin, preceded by a slight intoxication. Large doses (60 to 90 c. c.) in cases of violent colic were not a success, nor would they produce narcosis when given prior to surgical operation. The initial phase was followed by a period of excitement lasting several hours and accompanied by tetanic spasms. When an equivalent dose of morphin was given intravenously, similar symptoms were produced, while the equivalent quantity of alcohol (60 to 90 c. c.) produced symptoms of intoxication solely. Therefore the writer concludes that in colic the intravenous dose of tincture of opium should not exceed 30 to 40 c. c.

Dr. J. A. Gilruth, formerly a professor in the Veterinary College at Melbourne, Australia, and more recently Administrator of Northern Territory, Australia, spent a week in Washington, D. C., studying the various methods of tick eradication applied in this country. Later he visited Louisiana and Texas for the purpose of seeing the work in actual operation on the open range, with the view of submitting a complete report to his government, which is likewise confronted with the tick problem.

ARMY VETERINARY SERVICE

NEWS FROM THE SURGEON-GENERAL'S OFFICE

NUMBER OF VETERINARY OFFICERS ON DUTY

The Office of the Surgeon General of the United States Army has furnished the following information as to veterinary officers on duty.

Officers, Veterinary Corps, United States Army, with temporary rank as authorized by Congress in act providing for 18,000 officers until June 30, 1920, on duty on dates shown (1919):

	Oct. 11.	Nov. 11.	Dec. 11.
Colonels	0	0	0
Lieutenant Colonels.....	5	4	4
Captains	77	75	72
Majors	43	40	37
First Lieutenants.....	167	160	156
Second Lieutenants.....	86	74	72
Totals.....	378	354	342

Officers, Veterinary Corps, Regular Army, with permanent rank under act of June 3, 1916, on duty December 11, 1919:

Majors	7
Captains	17
First Lieutenants.....	21
Second Lieutenants.....	47
Total	92

TRANSFERS AND REASSIGNMENTS

The following orders of transfer and reassignment have been issued for veterinary officers:

Major B. A. Seeley, U. S. A., from Camp Upton, N. Y., to Re-mount Depot, Camp Meade, Md., for duty as the veterinarian.

Major G. H. Dean, U. S. A., having completed his instruction in meat inspection, is relieved from duty with the Zone Supply Officer, Chicago, Ill., and assigned as Camp Veterinarian, Camp Bragg, N. C.

Major A. L. Mason, U. S. A., General Veterinary Inspector with headquarters at Kansas City, Mo., has been relieved from his present station and directed to proceed to Washington, D. C., for station and

duty as General Veterinary Inspector in that territory formerly covered by Major J. P. Turner and Lieut. Col. G. E. Griffin, U. S. A., which embraces the entire Atlantic Seaboard States.

Major W. R. Pick, U. S. A., General Veterinary Inspector, from Fort Worth, Texas, to San Antonio, Texas, for station to act as General Veterinary Inspector for the States of Texas, Oklahoma, New Mexico, Arizona, Montana, Wyoming, Idaho, Utah, Nevada, Washington, Oregon and California.

Major T. H. Edwards, U. S. A., from Auxiliary Remount Depot, Camp Jackson, S. C., to Auxiliary Remount Depot, Camp Gordon, Ga.

Lieut. Col. R. Vans Agnew, U. S. A., from duty as Post Veterinarian, Fort D. A. Russell, Wyo., to Camp Dodge, Iowa, for duty as Division Veterinarian, 4th Division, and Camp Veterinarian, Camp Dodge, Iowa.

Major G. H. Koon, U. S. A., from duty as Division Veterinarian, 4th Division, Camp Dodge, Iowa, to Zone Supply Officer, Chicago, Ill., for instruction in meat inspection.

Major H. S. Williams, U. S. A., on expiration of leave of absence is assigned as Division Veterinarian, 6th Division, Camp Grant, Ill.

Major A. E. Donovan, U. S. A., Division Veterinarian, 6th Division, on being relieved by Major Williams is directed to proceed to Siberia for duty as Chief Veterinarian, American Forces in Siberia.

Captain J. A. McKinnon, V. C., Chief Veterinarian, American Forces in Siberia, upon the arrival of Major Donovan is relieved from duty and directed to proceed to the United States for assignment.

Captain J. R. Stifler, V. C., Camp Taylor, Ky., to Kansas City, Mo., for duty with the Purchasing Quartermaster that place.

Captain C. B. Dunphy, V. C., from Headquarters Southern Department, Fort Sam Houston, Texas, to Chicago, Ill., for instruction in meat inspection.

Captain E. P. Coburn, V. C., from Camp Dodge, Iowa, to Kansas City, Mo., for duty with the Purchasing Quartermaster that place.

Captain E. P. O'Connell, V. C., from Remount Depot, Camp Devens, Mass., to Chicago, Ill., for instruction in meat inspection, upon the closing of the Remount Depot at Camp Devens, Mass.

Captain E. J. Cramer, V. C., upon the closing of the Remount Depot, Camp Custer, Mich., is directed to report to Chicago, Ill., for instruction in meat inspection.

Captain H. N. Beeman, V. C., upon the closing of the Remount Depot, Camp Sherman, Ohio, is directed to report to Camp Sherman, Ohio, for duty as Camp Veterinarian.

Captain H. H. Howe, V. C., from duty as Camp Veterinarian, Camp Sherman, Ohio, to Remount Depot, Camp Gordon, Ga., for duty.

Captain J. L. Ruble, V. C., from Remount Depot, Camp Gordon, Ga., to Chicago, Ill., for instruction in meat inspection.

Captain G. W. Brower, V. C., recently returned from duty as Department Veterinarian, Philippine Department, is directed to proceed to Chicago, Ill., for instruction in meat inspection.

Captain E. C. Conant, V. S., from Remount Depot, Fort Keogh, Mont., to duty as Transport Veterinarian, U. S. A. T. "Dix," Seattle, Wash.

Captain V. B. Wright, V. C., from duty as Transport Veterinarian, U. S. A. T. "Dix," to Remount Depot, Fort Keogh, Mont.

Captain H. R. Wise, V. C., recently returned from duty overseas, is assigned to duty with the 2d Division, Camp Travis, Texas.

Captain J. P. Divine, V. C., from Port of Embarkation, Hoboken, N. J., to 6th Division, Camp Grant, Ill., for duty.

Captain J. W. Crouse, V. C., upon the closing of the Remount Depot, Camp Dix, N. J., is directed to proceed to Chicago, Ill., for instruction in meat inspection.

Captain K. F. Hinckley, V. C., upon the closing of the Remount Depot, Camp Lewis, Wash., is directed to proceed to Chicago, Ill., for instruction in meat inspection.

Captain W. H. Dean, V. C., having completed the course of instruction in meat inspection at the Zone Supply Office, Chicago, Ill., is transferred to Fort Jay, Governors Island, N. Y., for duty as the Post Veterinarian.

HUMANE DISPOSAL OF BLIND ARMY ANIMALS

As a result of recommendations originating with Major John P. Turner, V. C., when he was serving as a General Veterinary Inspector, which were strongly concurred in by the Veterinary Division, Surgeon General's Office, the War Department recently changed the regulations regarding the sale of blind Army animals. For humanitarian reasons solely, blind animals, even if otherwise serviceably sound when inspected and condemned, will not be sold but will be killed.

ASSOCIATION NEWS

UNITED STATES LIVE STOCK SANITARY ASSOCIATION

The twenty-third annual meeting of this Association was held in Chicago, Ill., December 1, 2 and 3, 1919.

In his address of welcome Governor Frank O. Lowden of Illinois referred to the meeting being held simultaneously with the International Live Stock Show which is the greatest in the world. "Its influence during 20 years has been felt in every corner of this country," he stated. The Governor spoke as a breeder of farm live-stock and referred to the service of the veterinary sanitarian as being beyond calculation. He said: "In tuberculosis alone you have accomplished the almost impossible." He referred to Europe being pretty well depleted of live stock and stated his opinion that "no farmer could afford to use anything but a purebred sire." And yet he recalled that there is only a small percentage of farms in America that do not pursue the old wasteful, extravagant method of using scrub sires. He concluded by stating: "Agriculture is the basic industry of any land. Without better methods of agriculture and especially without better methods in the live-stock industry, America will soon reach the stage where she can not feed herself."

In responding, Mr. D. A. Wallace, editor of "The Farmer," stated: "We have admired the understanding of the situation which Governor Lowden has shown in his address. Farmers are maintaining their equilibrium and will continue to act in the right way during the weeks and months to come." He referred to the awakening of the farm people to the necessity of formulating a national program of agriculture in its relation to our other great industries. He paid tribute to the memory of Dr. S. H. Ward, whose death occurred just after the meeting a year ago, and said: "His wonderful direction of his work, his broadness of vision, his great understanding, aided Minnesota to assume leadership in live-stock sanitary work among the States."

President G. W. Dunphy in his presidential address mentioned the valuable service rendered by the Legislative Committee in securing better salaries for inspectors of the Bureau of Animal Industry and considered it very important that efforts of the Association should be continued in this direction. He recommended

that some steps be taken to secure better protection of States from disease introduced by live stock moving through public stockyards.

Chairman Mat S. Cohen of the Legislative Committee recounted the experience of his committee in getting Congress to appropriate more money for salaries for B. A. I. men. He said the amount secured was a mere pittance and that a million dollars should be added. He referred to the restrictions on the appropriation for tuberculosis eradication which left the Bureau without sufficient funds for operation in this field.

The entire afternoon session on December 1 was given over to a symposium on tuberculosis. Several of these papers will be published later.

A session on swine diseases was held Tuesday morning, December 2. The session was opened with the presentation of a paper by Hon. W. W. Wright of Illinois, entitled "Safe and Practical Regulations for Handling Feeder Hogs." The paper led to a lengthy discussion in which many members of the Association participated, during which Dr. D. F. Luckey of Missouri asserted that a number of biological concerns were marketing impotent anti-hog-cholera serum, that one concern actually practiced "plugging" impotent with potent serum, and that heavy losses among hogs at the Kansas City stockyards were chargeable to this evil.

Dr. R. R. Birch of New York, in replying to Dr. Luckey, aptly pointed out that, since one or more serum companies had been accused of marketing unsatisfactory products, it should not be difficult to secure the correction of this evil if the name or names of the company or companies were frankly given.

Dr. A. W. Miller of the Bureau of Animal Industry stated that the immunization of hogs at the Kansas City stockyards until two years ago had not been under the supervision of the Bureau. Since then losses have been very materially reduced. He denied that any biological product concern uniformly turns out poor serum, and asserted that the losses at the stockyards were decidedly lower than Dr. Luckey claimed them to be.

Dr. J. I. Gibson of Illinois said that St. Joseph was a bad market from which to buy stock hogs, but attributed this to the length of time hogs are permitted to remain in the yards. He suggested that the order or regulation which permits hogs to remain in public stockyards five days should be changed to three days.

Great surprise at Dr. Luckey's statement was expressed by Hon. J. H. Mercer of Kansas. He advised Dr. Luckey to secure authority

from his State to eliminate the use of objectionable serum produced within his own State. He further said that Government supervision had been most helpful and that losses due to hog cholera had been enormously reduced. Like Dr. Gibson and several other speakers, he believed that losses among stockyard hogs were largely due to other causes than impotent serum, and that such losses were in a measure proportioned to the length of time hogs were permitted to remain in the yards.

Dr. A. T. Peters of Illinois advised that hogs should be gotten out of the yards as soon as possible.

A motion was made, seconded and carried that the United States Live Stock Sanitary Association appoint a committee of from three to five members, and that the Swine Breeders' Association be requested to appoint a similar committee, the two to confer with regard to possibly desirable changes in the present methods of dealing with hogs in stockyards.

A paper was next presented by Mr. Carmichael, secretary of the National Swine Breeders' Association, though his name did not appear on the program of the session. The title of the paper was "Regulations for the Shipment of Crated Hogs." The conditions under which purebred hogs are shipped were first defined and attention was then called to the troublesome and confusing differences in the various State regulations governing the shipment of hogs. A plan was made for uniform regulations.

Accompanying this paper a table was presented showing the lack of uniformity of State regulations for the year 1919 relative to the interstate shipment of breeding hogs in crates.

Dr. U. G. Houck of the Bureau of Animal Industry presented a report on the progress in hog cholera control during the year 1919, in which he called attention to the need for uniform regulations in different States relative to the movement of hogs, and proposed regulations which merit careful study.

Following this paper Dr. A. L. Hirleman of Georgia presented the report of the Committee on Hog Cholera, which had been printed and was distributed among the members of the Association.

Dr. A. T. Kinsley of Missouri next presented the report of the Committee on the Differential Diagnosis of Swine Diseases, in which the contradictory character of the ideas prevalent regarding these diseases was discussed and the need for distinguishing more sharply in the future between facts and theories was pointed out. A list of the names of the diseases which should be specifically

recognized was given. Hog cholera, because of its importance, was placed at the head of the list, and it was stated that our knowledge of the cause of this disease remains incomplete. Hemorrhagic septicemia was characterized as an affection which may be primary, but which is usually secondary; infectious abortion of swine as an evil which requires more attention in the future; conditions produced by the colon and paratyphoid group of bacteria as requiring better sanitary control. Tuberculosis, actinomycosis, anthrax, infectious rhinitis or bull nose, necrotic enteritis, etc., were also briefly discussed.

Dr. A. W. Dimock of Kentucky read a paper on the occurrence of the colon bacillus in the deeper tissues of swine, and expressed the opinion that the penetration of these bacilli into the deeper tissues was facilitated by, if not entirely dependent upon, the existence of abnormal conditions.

Dr. W. E. King of Minnesota presented a paper on the symptoms, lesions and diagnosis of conditions produced in hogs by *Bacillus paratyphosus* and *B. enteritidis*, and emphasized the need for the careful study of other hog diseases than that produced by the ultra-microscopic virus.

In the absence of Dr. Robert Jay of Tennessee, Dr. M. Jacob of that State presented a paper prepared by the former on the comparative symptoms and lesions of hemorrhagic septicemia and hog cholera. Attention was called to the transmissibility of septicemia to other species of animals; to the facultative pathogenic character of its bipolar organism, and to the dependence of the disease on environmental conditions, particularly a high protein diet, and diet too rich for the amount of exercise taken.

In the place of the paper of Dr. W. L. Boyd of Minnesota, a paper by Edward W. Boddington, Esq., was presented. Attention was called to the arbitrary and unfair character of some State laws for the control of hog cholera; the work of the Federal Bureau of Animal Industry was indorsed and the belief expressed that no biological products should be sold unless they were produced under United States license; the character of the laws needed was defined; State serum plants, while they may have been justified in the experimental stage, were condemned as failures.

The abortion disease session was held on Tuesday afternoon, December 2. Although this session was specially appointed for the consideration of abortion disease, it was opened with a discussion of the papers on swine diseases presented in the morning. The prin-

cial matters brought out in this discussion were the need for making greater efforts to secure serum of the highest purity and freedom from contamination with extraneous bacteria, and the desirability of a meeting of Federal and State officers engaged in the control of hog diseases, such meeting to be called by the Federal Government.

Dr. M. Dorset of the Bureau of Animal Industry pointed out that it is a mistake to treat hog diseases with bacterins before we know what they are, often to the neglect of the use of serum, when we are practically all agreed that hog cholera has retained the rank of first importance.

Dr. Ward Giltner of Michigan, before presenting the report of the Committee on Abortion Disease, read a short paper, prepared by himself and not submitted to the committee, relative to the name which it seems desirable we should give to the group of phenomena generally spoken of as abortion disease.

The report of the committee was a concise statement of the known facts about infectious abortion disease of cattle and a formulation of the simple conclusions relative to the control of the disease to which the facts point.

A paper on the etiology of so-called infectious abortion disease of cattle was then read by Dr. E. C. Schroeder of the Bureau of Animal Industry. In this the known etiological facts of the disease were summarized and simple control measures suggested.

The next paper was by Prof. W. L. Williams of New York. In this the Professor's views on the pathology of sterility were presented and various references made to the causes of calf scours and other calf diseases, some of which were characterized as having an ante-partum origin.

Dr. E. T. Hallman of Michigan presented a paper on the sequela of abortion bacilli infection of the bovine uterus. The bacteria found in ten cases studied were given, and the belief was expressed that lowered vitality often gives ordinarily harmless bacterial organisms an opportunity to establish themselves and to exercise a true pathogenic activity.

Dr. John F. DeVine of New York gave only a synopsis of his paper on practical methods of handling herds affected with abortion disease. This paper merits the careful study especially of practicing veterinarians.

The discussion of the various papers was opened by Dr. George F. Jungerman of Kansas, who expressed the belief that the papers were not sufficiently practical in character. He spoke about the

great losses due to abortion disease in the Middle West, where calf troubles were also very common. He doubted the reality of the agglutination test when applied to single animals, but did not refer to the information that may be gained through its application to a herd.

In the general discussion it was brought out that the differences in the views held by different investigators on abortion disease of cattle are, in the final analysis, not very great, and that if there are factions they are gradually getting together. It was brought out strongly by more than one speaker that the harm that so-called secondary invaders may do can not detract from the importance of the Bang bacillus, the activity of which paves the way for the secondary invaders, which in most cases would be harmless organisms if the Bang bacillus could be eliminated. Bacterin treatment of abortion disease of cattle received very little attention, though one statement was made to the effect that autogenous bacterins used against secondary invaders had given remarkably encouraging results.

On Wednesday morning, Dr. L. Van Es being absent, the report of Committee on Diseases was read by Dr. D. M. Campbell. Attention was called to the wide propaganda on diseases of hogs and mention was made of the much talked of presence of hemorrhagic septicemia, mixed infections, "flu," etc. Recommendations were made that on account of the maze into which the veterinary profession is at present in regard to diseases of hogs, it is an opportune time to devote considerable effort to their solution. Abortion, it was said, is recognized as very infectious and very prevalent, and the importance of further scientific investigation was expressed. On account of the varieties of pneumonia of sheep and swine, it was declared, much investigation will be necessary to clear up these troubles. Dr. Van Es strongly recommended a Bureau of Statistical Data on the Diseases of Animals (communicable diseases).

In the discussion which followed it was pointed out that certain States do now attempt to be advised of the prevalence of contagious diseases and that there are statutory laws making it compulsory for veterinarians to report all such diseases, Illinois having just passed such a law, \$500 fine being the penalty for failure to comply.

Dr. B. H. Ransom of the Committee on Special Skin Diseases presented a very comprehensive and complete report on the prevalence of the skin diseases of animals, but principally of the wide prevalence of scabies at the present time in sheep and cattle, al-

though there is now actually less than at the close of the war period. The new centers of infection throughout the country were attributed to the going to war of the sanitary inspectors, the lack of help to do dipping, the general demoralized state of help, and the absolute necessity of moving sheep and cattle regardless of the scabies infection. The vicissitudes of dipping in cold weather were discussed and suggestions were made for compulsory dipping of feeder sheep at owner's premises. Lime and sulphur dips and nicotin dips were held to be the principal efficacious dipping agents.

Dr. Ransom went into details of strength of dips used and the manner of using them, and recommended that in treating cattle scabies hand treatment and scrubbing methods are important adjuncts to the actual dippings. It was pointed out that many treatments are at times necessary to overcome scabies and that in treating only affected animals it was found that as many as 5 to 8 treatments have at times been necessary. After treatment it might require 6 to 8 weeks before the animals regain normal health, as affected animals are in a very poor condition on account of the disease. Kerosene is at times beneficial in treating limited areas, but is severe on the animal's skin. Nicotin makes the cattle very sick at times, but after about two hours they begin to regain their stability after judicious use of cold water dashed on the face of the sick cattle.

Dr. F. Torrance of Canada, in speaking on the subject, stated that they had no sheep scabies in Canada and cattle scabies occurred only in restricted areas of the Northwest Provinces. He highly recommended that the temperature of the dip be raised to 110 to 120° F. and thought the results would be much better. He spoke of the almost impossibility of eradicating the disease in so wild a country, as sometimes a cow with calf would hide out when the rest of the bunch might be collected for dipping.

Dr. Adolph Eichhorn stated that it had been impossible to collect data for his proposed paper on the uniform State regulations of biological products.

Mr. F. R. Marshall of the Bureau of Animal Industry spoke on the subject of sheep husbandry and its changing character in the United States due to the breaking up of western ranges into smaller tracts because of farming operations. He presented the necessity of limiting the numbers of sheep in these States to meet conditions as they arose, but drew attention to the fact that irrigated farms could care for many feeder sheep when the range country became unable to do so. On account of different conditions on farms as

compared to range conditions more diseases in sheep will of course manifest themselves. Mr. Marshall suggested that the Live Stock Association should take up the matter of organizing agricultural staffs in each county to give advice on animal husbandry and animal diseases, stating that more educational and demonstration work is necessary, and indicated that a trained animal specialist should be in charge of the county bureaus.

Mr. Felker of New Hampshire cited a case of disastrous result from a demonstrator in sheep husbandry, and strongly advised that a veterinarian is the proper person to give advice on sanitary matters.

Dr. I. E. Newsom of the Colorado Agricultural Experiment Station read a paper on hemorrhagic septicemia as affecting the sheep industry in Colorado. He stated that although there were many outbreaks of the disease the losses except in rare instances were not exceptionally heavy, the disease usually dying out of itself after the animals had become used to their new environment. Dr. Newsom pointed out his belief that it is a probability that some predisposing factor, as shipping by train, hard drive, changed character of feed (perhaps to heavy protein diet), dipping, etc., is necessary in the incidence of the disease. The feed lots of Colorado and the lambing grounds, he said, are the usual centers of infection.

In the discussions that followed Dr. Kinsley supported the contentions of the essayist, while Dr. W. J. Butler of Montana expressed doubt that the losses of sheep were so universally caused by the hemorrhagic septicemia organism. Dr. Kinsley thought that disinfection of the yards and cars would materially reduce the number of outbreaks of the disease. In regard to preventive treatment, Dr. Newsom thought bacterins were of little efficacy and that possibly live organism treatment of the flock would be an effective preventive of the disease. Dr. Kinsley combated this suggestion and thought that it would be a hazardous undertaking.

Dr. L. E. Day, in discussing the statement that the disease often followed dipping, stated that although he had investigated quite a number of cases following dipping he did not find hemorrhagic septicemia in a single instance, although he had followed the post-mortem examination by the approved bacteriological methods for the detection of this disease. He thought that the deaths were due to pneumonia following exposure after dipping.

Dr. Butler mentioned a form of edematous pneumonia in sheep over 3 years of age occurring in Montana and producing a 5 per

cent loss of old ewes, that is not caused by the bipolar organism, and mentioned that sudden change of character of feed, as from short grass pasture to beet tops or beet by-products, will induce the pneumonia, and that it can be prevented by providing alfalfa or other good hay in addition to the beet roots.

At the final session in the afternoon, Mr. A. F. Stryker, secretary and traffic manager of the Omaha Live Stock Exchange, spoke on "Sanitation and Live-Stock Transportation," and made an earnest appeal for the stabilizing of the various State laws regarding the requirements for the entrance of animals into the various States. He thought that one law for all States should suffice, and complained of restrictive laws in certain States wherein no animals are permitted to enter the State in non-disinfected cars although the cars might be otherwise clean. Attention was also directed to the requirements in certain States of the tuberculin test of cows and bulls although on shipment of these animals from the public stockyards affidavits had been made that they were for feeder purposes and were shipped accordingly under interstate regulations.

In the discussion which followed, Dr. T. A. Burnett of Ohio gave as Ohio's reason for requiring tuberculin test and inspection and quarantine regulations the promiscuous dumping of reacting cattle into Ohio when the State is trying to clean up and is paying indemnity for reacting animals, and stated that the \$100,000 meant for this purpose is not intended for reactors brought in under the guise of feeders, when as a matter of fact unscrupulous cattle dealers, after bringing them into the State, sell them to whoever has the price.

Dr. B. F. Davis, State Veterinarian of Wyoming, showed how an affidavit was prepared by a commission firm in Denver for a carload of bulls "for feeders" and stated that the affidavit was fraudulent, also that the States are likely to be imposed upon by unscrupulous commission men and by unscrupulous dealers in cattle.

Dr. Robert D. Wall of Iowa explained fully why Iowa insists on the disinfection of cars by stating that cattle shipped in a car in which hog cholera hogs had been were likely to carry cholera to any farm they were taken to, and stated that many of the affidavits are obtained by fraud.

Dr. Gibson advocated cleaned and disinfected cars for all stock destined to the farm.

Dr. J. A. Kiernan of the Bureau of Animal Industry read proposed amendments to the regulations for the accredited herd plan which permitted the establishment of a supplementary herd list

wherein all cows must be free from the disease and reacting bulls must be kept segregated, serve cows on neutral ground and must be handled with a staff.

Mr. George McKerrow of Wisconsin was present at the afternoon session and availed himself of the invitation to speak on "The Sheep Industry." The ease with which he attacked the subject was proof of his mastery of this business, both in the production of wool and of mutton.

Dr. Gibson presented a series of resolutions, which were adopted. The movement for increase of salaries of inspectors of the Bureau of Animal Industry was indorsed and the Association's support was pledged in calling attention of Congress to such desirable legislation. The Bureau work on hog cholera control and tuberculosis eradication was approved. The continuance of scientific studies of all other swine diseases to facilitate their control was advocated.

Resolutions were passed that the Association should on any and all occasions champion the cause of the horse as having a proper and useful sphere in America which has been threatened by the overzealous automobile propaganda.

The Association recommended that race horses, on account of the extreme care taken by their owners in preventing disease among them, be permitted to go in interstate traffic without being mallein tested, and that uniform State laws be advocated which will permit of such shipments.

Intensely interesting as the whole meeting was, everyone present at the closing session had a treat in the sparring that took place in the selection of suitable timber for officers for the coming year. Dr. Lester O. Howard, nominated by Dr. Butler and seconded by Drs. DeVine and Cassius Way, was defeated for the presidency by Dr. S. F. Musselman of Kentucky, nominated by Mr. Mercer, Live Stock Commissioner of Kansas, and seconded by Dr. Gibson of Iowa and Dr. Dunphy of Michigan. Drs. E. M. Ranck, F. A. Bolser, W. F. Crewe and J. Reeves and Hon. J. H. Mercer were selected as vice-presidents. Dr. D. M. Campbell of Chicago was selected as secretary-treasurer.

OHIO STATE VETERINARY MEDICAL ASSOCIATION

THE thirty-seventh annual meeting of the Ohio State Veterinary Medical Association will be held in Columbus, at the Deshler Hotel, January 15 and 16, 1920.

The Committee on Local Arrangements and the officers of the Association are exerting every possible effort to make the thirty-seventh the most successful meeting, which bespeaks something when the excellency of former Ohio meetings is taken into consideration.

A study of the program, which has been mailed to the members of the profession, reveals the fact that a number of very important subjects have been selected by the men who will address the meeting. Some of the topics pertain to subjects the solution of which the profession is confronted with today.

The city of Columbus has been selected as the place of meeting for the A. V. M. A. in 1920. This being a fact, it behooves every Ohio veterinarian to attend the meeting of the State organization in January and to do his part by assisting in the perfection of plans whereby the State Association can most royally entertain the National Society next August.

The management of the Deshler Hotel is extending the hospitality and courtesies of the house. The hotel is centrally located, facing Broad Street, opposite the State Capitol. It is the most modern and up-to-date hotel in the State. It has a beautiful, spacious lobby, entresol and grand lounge. Conveniences unexcelled.

Address all inquiries in regard to details of the meeting to

R. I. BERNATH, *Secretary, Wauseon, Ohio.*

NEW YORK STATE VETERINARY MEDICAL SOCIETY

DR. GANNETT has reported as follows on the clinical cases exhibited at the meeting of the New York State Veterinary Medical Society, held in Brooklyn in October.

The open navicular bursa case by Dr. R. S. MacKellar, operated upon by Dr. J. N. Frost, Professor of Surgery at the New York State Veterinary College, Cornell University, did well and walked home in about one month.

The 2-year-old colt furnished by Drs. Gannett and Risley and castrated standing by Dr. P. J. Axtell had a temperature of 105° F. on the fifth day. The wounds were opened, when considerable liquid escaped and the temperature subsided.

The roan gelding with quittor and ossification of lateral cartilage furnished by Dr. R. S. MacKellar and operated upon by Drs. Frost and Gannett did well for three weeks, when swelling and lameness appeared. A second operation was performed, some detached bone being removed, which resulted in prompt healing. In this case the

coronary band was left intact and recovery took place with no blemish on the hoof.

The 2-year-old stallion with an umbilical hernia about the size of a duck's egg, furnished by Dr. R. S. MacKellar and operated upon by Dr. Frost by stitching the skin without incising it, made a partial recovery. The size of the hernia was reduced about one-half. A second operation was performed by Dr. Frost at the end of five weeks; the skin over the hernia was incised down to the hernial sac or peritoneum, which was then pressed back through the hernial ring and stitched there. This operation resulted in a good recovery.

The bay gelding with necrosed first upper molar, furnished by Drs. Gannett and Risley, operated upon by Dr. Frost by extraction with forceps with considerable difficulty, did well and illustrates that trephining can be avoided in many instances.

The postmortem performed by Dr. S. A. Goldberg was upon an aged bay gelding which had been given a dose of aloes for intestinal obstruction. The physic operated and the animal did well for a few days, when pain again appeared and continued at intervals for six days, with impaired appetite but no rise of temperature until the sixth day. Then the temperature went up, pulse became weak, patient perspired, and death occurred. Postmortem revealed peritonitis with small amount of fecal contents in the abdominal cavity and a rupture of the cecum about 2 inches long near the ileo-cecal valve. This rupture was not recent, as the edges were granulating.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

THE Pennsylvania State Veterinary Medical Association will hold a meeting at Harrisburg, Pa., January 19 and 20, 1920. All veterinarians are cordially invited to be present.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION

THE tenth semi-annual meeting of the Central New York Veterinary Medical Association was held at Syracuse November 26, 1919.

The meeting opened at 10 a. m. with a clinic at the infirmary of Dr. J. A. Pendergast.

The following cases were operated on:

Gray gelding, tumor of the membrane nictitans; surgeons, Drs. E. E. Dooling and W. L. Clark.

Brown mare, pus in the nasal and frontal sinuses; surgeons, Drs. J. H. Stack and W. M. Long.

Roan pony, removing depressor muscles of the tail; surgeons, Drs. Frank Morrow and E. E. Dooling.

Black mare, removing the ovaries; surgeons, Drs. McAuliff and Boardman.

Bay stallion, median neurotomy; surgeons, Drs. Salsbury, Stack and Long.

Bay horse, median neurotomy; surgeons, Drs. Stack and McAuliff.

Roan horse, median neurotomy; surgeons, Drs. Stack and McAuliff.

Bay gelding, roaring operation; surgeons, Drs. Boardman and McAuliff.

Black horse, neurotomy of right hind leg at hock; surgeon, Dr. W. L. Clark.

At the close of the clinic the meeting was adjourned to the Hotel St. Cloud, where the business session was called to order at 3:30 p. m. by the president, Dr. W. L. Clark.

Roll call showed the following members present: Drs. D. A. Boardman, J. K. Bosshart, I. L. Buchanan, F. M. Burk, W. L. Clark, E. E. Cole, E. E. Dooling, O. P. Jones, W. M. Long, McAuliff, L. G. Moore, Frank Morrow, J. A. Pendergast, W. M. Pendergast, W. H. Salsbury, George A. Shaw, J. H. Stack, M. W. Sullivan, W. B. Switzer, W. M. Thompson, A. J. Tuxill, F. E. York.

Minutes of the last meeting were read, approved and ordered placed on file.

At this stage of the meeting the secretary received a telegram from Dr. J. M. Currie expressing his regrets at being unable to be with us, and wishes for a successful meeting. On motion by Dr. Dooling, seconded by Dr. Morrow, the secretary was instructed to write Dr. Currie in behalf of the society, expressing our regrets at his recent illness and congratulations for his recovery.

The special committee that was appointed at the June meeting to look into the matter of securing an operating table for the use of the society at its clinics reported that they had been able to secure one at the extremely low price of \$61.15, including transportation, repairs, and installing. They also reported that they had decided to install it in the infirmary of Dr. J. A. Pendergast, as he was willing to give the society the use of the infirmary in exchange for

his use of the table from one meeting to another. The action of the committee was approved by the society.

The following names were proposed for membership: Drs. Frank Burk, DeRuyter, N. Y.; W. M. Thompson, Skaneateles, N. Y.; W. H. Salisbury, Clifton Springs, N. Y.; George A. Shaw, Manchester, N. Y. The last two names were proposed as associate members, as they are out of the territory included in our charter. The above-named gentlemen were unanimously elected to membership.

At this time Dr. F. W. Sears, sanitary inspector of Syracuse, arrived and was introduced by the president. Dr. Sears gave a very interesting talk along the line of milk, meat and market inspection in cities and villages, holding very strongly to the opinion that the office should be filled only by a competent veterinarian. His talk brought out a good discussion and he answered many questions raised by the members, at the close of which a vote of thanks was extended to Dr. Sears.

Dr. O. P. Jones, being called upon, gave a very interesting paper in the form of a case report on azoturia. His paper brought out a good discussion, and showed that where raw linseed oil and turpentine had been used the results were generally good.

Dr. J. K. Bosshart was then called upon and presented a very interesting paper entitled "A Destructive and Undiagnosed Disease of Cattle in New York State." This paper also brought out a good discussion, and while others had had more or less of the disease, it still remained undiagnosed. Dr. Bosshart was of the opinion that it was a form of hemorrhagic septicemia.

Following these papers an animated discussion on a variety of subjects occupied the balance of the time.

No further business appearing, the meeting adjourned until June, 1920.

W. B. SWITZER, *Secretary*.

CONFERENCE OF NEW YORK VETERINARIANS

The New York State Veterinary College at Cornell University will hold its annual Conference for veterinarians January 15 and 16. It offers a very attractive program.

ONTARIO VETERINARY COLLEGE ALUMNI

A MEETING of the Alumni of the Ontario Veterinary College was called at New Orleans with a big number present. Graduates present were as early as 1880 and as late as 1916.

Dean McGilvray of the college gave an outline of the activities of the work at the college. It was the opinion of all present that

the summer course with a preceptor as demanded by the college was a good idea and should be continued.

After discussion, all present were in favor of the president of the Alumni appointing a committee to campaign for funds in order that a scholarship might be maintained at the college to commemorate the life of the late Andrew Smith. The amount decided on was \$5,000. All graduates are requested to send their names and addresses to Dr. Tait Butler, 323 Falls Building, Memphis, Tenn., who will mail out particulars of the campaign.

Officers of the Alumni: President, L. Enos Day, Chicago, Ill; vice-president, George Hilton, Ottawa, Canada; secretary, Hubert Shull, Texarkana, Ark.; treasurer, S. Brenton, Detroit, Mich.

The organization will be extended at Columbus (A. V. M. A. meeting) next year.

HUBERT SHULL, *Secretary.*



Memorial tablet at Ontario Veterinary College to members of the faculty, alumni and undergraduates who fell in the great war.

INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS

THE International Association of Dairy and Milk Inspectors held the eighth annual convention at Hotel McAlpin, New York City, December 4-6. The program covered a wide range of subjects relating to the supervision and improvement of milk supplies. Special committees of the Association reported regarding new legislation affecting milk and milk products, dairy farm inspection, transportation and marketing of milk, methods of bacterial analyses of milk, transmissible diseases, organization and administration of milk control, construction of dairy buildings and its relation to sanitation, pasteurization of milk and cream, and food value of milk and milk products.

COMMUNICATIONS

NEW ORLEANS FRENCH OPERA HOUSE BURNED

To the Editor:

INASMUCH as a number of the veterinarians and their wives who attended the late meeting of the A. V. M. A. in New Orleans patronized the French Opera, it may interest them to know that the old historic structure was completely destroyed by fire on the night of December 3. Fortunately, however, no lives were lost.

The old building has stood for years as an exponent of one of the chief characteristics of the French descendants of southern Louisiana, their inherited love of art and their sociability. The edifice represented the finest traditions of new France, as evolved from the old. It held memories sacred to the élite of New Orleans in its earliest days. It was a temple of society, the one shrine where for generations friends and relatives gathered to mingle with one another and in the meantime hear the opera.

How unfortunate indeed that a structure so replete with memories of the past, so distinctly monumental, should have been destroyed. It is to be regretted that there are few enough such monuments in the provincial life of various sections of our country, and we can ill afford to spare any of them.

E. I. SMITH.

PUS IN FRONTAL SINUS

To the Editor:

Herewith is a veterinarian's mistake. Publish it if you think it of value.

On November 8 a client of mine living 12 miles north of Hankinson who was the owner of purebred Holsteins called at my office. He stated that his bull had a sort of bronchitis and he would be glad to have me see him. I examined the animal that same day.

HISTORY.—Animal had been sick about three days, had refused all feed, would lie down and took no interest in anything.

SYMPTOMS.—Animal recumbent but when made to get up he did so after some effort. Great depression, quickened breathing, back arched, left eye half closed and discharging tears over face, right eye partially closed but no discharge, drooling from the mouth, con-

stipation, very little movement of bowels on auscultation, temperature 104.5° F.

DIAGNOSIS.—After going carefully over animal and not finding any other symptoms, and as it was hemorrhagic septicemia time, I so pronounced it and advised vaccination and segregation of the bull, all of which was done.

On November 19 I received a hurry call from the same client, who was very much upset. He said, "Doctor, the \$500 cow that stood alongside the bull is sick, I am afraid she is going to die." This case was simple, being only a mild attack of indigestion that responded beautifully to the usual treatment.

After treating the cow I asked to see the bull. On entering the boxstall I noticed the odor of rotting flesh and so remarked to the owner. I asked him to catch the bull, which was apparently well, and I made another examination. I discovered some pus around the base of the left horn, which was only about one inch long, having been dehorned one year previously. On testing the stability of this horn I found it loose. With the aid of a pair of scissors and pincers the shell was removed. Immediately a lot of thick pus flowed out through the horn core. I opened up the passage into the frontal sinus, which was filled with pus. A hole was trephined and the sinus cleaned out, and at date of writing the bull is well, but the trephined hole is not quite healed. I am satisfied that I made a mistake in diagnosing hemorrhagic septicemia.

CHARLES H. HART,
Hankinson, N. Dak.

Dr. and Mrs. W. Herbert Lowe spent a few days in Washington on their return trip from New Orleans. They were particularly pleased with their visit to the Bureau of Animal Industry Sheep Farm at Vienna, Va., and the Experiment Station at Bethesda, Md., where they renewed their friendship with Drs. Cooper Curtice and E. C. Schroeder, respectively, in charge of these stations.

The National Geographic Magazine for December contains a most interesting discussion of the reindeer industry in Alaska as fostered by the Department of the Interior. "The present need," the author states, "is for a scientific study of the animal. The importance of the industry demands it." Reindeer meat from Alaska is now shipped to Seattle and Minneapolis for distribution.

MISCELLANEOUS

BREEDERS AND VETERINARIANS DISCUSS TUBERCULOSIS

DURING the International Live Stock Exposition at Chicago a conference of live-stock owners, representatives of the thirteen purebred cattle breeding associations and State and Bureau of Animal Industry live-stock sanitary officials was held at the Saddle and Sirloin Club. The purpose of this conference was to discuss the subject of tuberculosis and especially the accredited herd plan.

After a very sumptuous beefsteak dinner a number of short speeches were made by the representatives of the purebred cattle associations, followed by short talks by several State and Federal live-stock officials. It was the unanimous voice of the conference that the campaign of eradicating tuberculosis be carried on along conservative and progressive lines, but that it will be necessary to broaden the scope of the work by extending supervision over a larger number of herds than is permissible with the present funds appropriated for the work.

Discussion centered on two questions:

1. Keeping herd bulls which react to the tuberculin test.
2. The desirability of modifying present Federal regulations so that the owner of an accredited herd on finding a reacting animal can have the herd tested in 90 days or so and repeat if necessary, in order that he need not be off the accredited list for a longer period than absolutely necessary.

Both breeders and veterinarians talked to these questions.

Several veterinarians urged that the rules be modified so that reacting herd bulls of merit could be retained on what Dr. Mohler, Chief of the Bureau of Animal Industry, called "neutral ground." This amounted to segregating the bull under the Bang plan as practiced in Denmark. The bull would be put to the cows outside of his lot or paddock and proper measures taken to prevent his transmitting infection to the females.

Dr. Dunphy of Michigan upheld this plan in several talks, citing the case of the Holstein bull Hengerveld DeKol, which reacted as a yearling and was saved, and which proved later to be one of the greatest sires of the breed. Others who concurred were Dr. Charles

E. Cotton of Minnesota, Senator A. B. Hackney, Holstein breeder, of the same State; Dr. J. I. Gibson of Bloomington, Ill., and others.

A. B. Cook of Townsend, Mont., president of the American Hereford Breeders' Association, made vigorous objection to any modifying of rules. He declared that he did not want to buy an animal from a herd headed by a reacting bull. Dr. W. J. Butler, State Veterinarian of Montana, said it would never be practicable to retain reacting bulls under range conditions. They would have to be kept under some sort of Government supervision if kept at all. J. C. White of Winterset, Iowa, president of the Aberdeen-Angus Breeders' Association, opposed the idea also. J. C. Glover of Wisconsin asked how many farmers were fixed so they could keep a diseased bull safely.

C. P. Norgord, Agricultural Commissioner of Wisconsin, told of the progress of the work in that State. By Christmas every herd would be tested in Waukesha County, where the work was being done on the "area" plan. The State makes an annual appropriation of \$250,000 to carry on the work. Until they began to test whole herds not much progress was made. Testing single animals, he said, was like acting as an insurance company for dealers.

Other speakers were F. W. Harding, secretary of the American Shorthorn Breeders' Association; Everett C. Brown, president of the Chicago Live Stock Exchange; Thomas E. Wilson, Shorthorn breeder and packer, of Chicago.

Dr. D. F. Luckey of Missouri pleaded for the use of the intradermal test. He claimed this made it possible to test four times the number of cattle and had proved very effective.

On motion by Prof. Smith a committee of five breeders was named to meet with a committee from the United States Live Stock Sanitary Association to thrash out the questions at issue. The breeders named were: John Tomson, president American Shorthorn Breeders' Association, Dover, Kans.; A. B. Cook, Townsend, Mont.; J. C. White, Winterset, Iowa; Fred Pabst, Oconomowoc, Wis., and George P. Grout, Duluth, Minn.

The committee from the Sanitary Association was: Dr. J. A. Kiernan, Washington, D. C.; Dr. Charles E. Cotton, Minnesota; W. W. Wright, Springfield, Ill.; Dr. Frederick Torrance, Ottawa, Canada, and Dr. Peter F. Bahnsen, Georgia.

Two sets of resolutions were unanimously adopted. The first petitioned Congress to transfer the unused balance provided for the payment of indemnities in the tuberculosis eradication appropriation

of the present year to the operating fund to be expended in that campaign at the discretion of the Secretary of Agriculture. At the present time the division of the funds for operating expenses and the payment of indemnities is unbalanced, inasmuch as only \$500,000 is provided for operating expenses and twice that amount for the payment of indemnity. The second resolution petitions Congress to make an annual appropriation of \$2,500,000 for tuberculosis eradication work.

"COOPERATION" THE KEYNOTE IN TUBERCULOSIS ERADICATION

THE campaign of eradicating tuberculosis of live stock on a co-operative basis has been in progress less than 2 years, but in that time it has gained so much popularity among the live-stock owners that much larger funds are required for the work.

On December 10, 1919, the Agricultural Committee of the House of Representatives held a hearing on the subject of tuberculosis eradication. In attendance at that hearing were:

Mr. Evert C. Brown, president The Chicago Live Stock Exchange.

Mr. Frank W. Harding, secretary American Shorthorn Breeders' Association.

Mr. M. D. Munn, president American Jersey Cattle Club.

Mr. S. M. Shoemaker, representing the American Guernsey Cattle Club.

Mr. A. B. Cook, president American Hereford Cattle Breeders' Association.

Dr. A. F. Woods, president Maryland Agricultural College.

Prof. H. R. Smith, live-stock commissioner, Chicago Live Stock Exchange.

Dr. J. A. Kiernan, chief, Tuberculosis Eradication Division, Bureau of Animal Industry.

Dr. J. R. Mohler, chief of the Bureau of Animal Industry.

Each of the above-named gentlemen addressed the committee and set forth the progress of the work and the tremendous demands for its expansion. Probably the most impressive feature of this conference was the fact that the thirteen purebred cattle associations of the United States were represented and unqualifiedly indorsed the campaign now in progress. It could not help but impress the Congressional committee that this work is being carried on through the cooperation of the live-stock owners, live-stock sanitary officials of the respective States, and the Bureau of Animal Industry.

One of the important features of the work is that there is nothing

coercive about it; it is being conducted solely upon voluntary lines. If an owner does not think he should eradicate tuberculosis at this time it is purely optional with him. The fact stands out very prominently, however, that this very course which is being pursued is the one thing that helps to make it popular, because it is based upon educational lines and the live-stock owners appreciate the fact that it is unprofitable to maintain a herd in which tuberculosis exists. The live-stock owners further appreciate the fact that prospective owners of cattle realize now more than ever before the necessity of purchasing healthy animals to bring into their herds; they are seeking out the herds that are known to be free from tuberculosis, or herds the owners of which are using every means to exterminate the disease.

The cooperating forces are fully cognizant of the fact that to make satisfactory progress in the tuberculosis eradication campaign it is necessary to employ the services of trained private veterinarians, and as an indication of the desire of all the cooperating forces to link up the private veterinarian with the officials in the work the accredited herd plan was recently amended so as to permit the testing of herds under the supervision of specially appointed private veterinarians under rules and regulations of the Bureau of Animal Industry. The amendment to the accredited herd plan is as follows:

"When a herd has been officially accredited continuously by the United States Department of Agriculture and the State for a period of two years, it may then be tuberculin tested annually by any veterinarian whose name is upon the accredited list of veterinarians approved by the United States Bureau of Animal Industry, provided that before any veterinarian other than one who devotes his entire time to the work of any State or the Bureau of Animal Industry can be approved for accredited herd work he shall have passed an examination conducted by the proper live-stock sanitary official of the State in which he resides and the Bureau of Animal Industry. He then shall be eligible to conduct annual tuberculin tests upon herds which have been officially accredited, upon dates approved by the proper State live-stock sanitary official and the inspector in charge of the Bureau of Animal Industry in the State wherein the herd is located.

"No herd test can be made by such an approved veterinarian unless he has instructions in writing from the State official to that effect. The dates of the annual tests for each herd shall be recorded in the State office and also in the office of the inspector in charge. On any annual test the State and the Bureau reserve the right to have a regularly employed official present on the farm to supervise the testing done by the approved veterinarian.

"The approved veterinarian shall conduct each test strictly in

accordance with instructions issued by the Bureau of Animal Industry to employees engaged in cooperative tuberculosis eradication work. At the conclusion of each test the approved veterinarian shall submit to the State Veterinarian and the inspector in charge of the Bureau of Animal Industry a copy of the record of the test.

"Any animal of a herd under supervision which may react in any herd tuberculin tested by an approved veterinarian shall be marked for the purpose of identification in accordance with the regulations of the State in which the animal is located.

"Tuberculin tests applied by veterinarians other than those regularly employed by the State and the Bureau of Animal Industry shall be paid for by the owner of the herd."

No campaign for eradicating an infectious disease of live-stock has ever been undertaken under more favorable conditions. The keynote of the whole campaign is "cooperation." This is an opportunity of which the veterinarians of the United States should take advantage. They should enter into it with a spirit of energy and with the determination to be of the greatest possible service to the live-stock industry of America. It is not a matter for personal gain; it is not to create positions for live-stock sanitary officials; it is not to obtain large appropriations from the respective States and from the Federal Government. It is a campaign started out of necessity because of the rapid spread of tuberculosis among cattle and swine. The live-stock interests of the United States demand that if tuberculosis is an eradicable disease prompt and vigorous efforts be immediately put in operation to exterminate it.

The whole campaign is based upon the patriotic desire of American citizens to make the live-stock industry of this Nation the peer of any in the world. This can be done if every person engaged in the campaign fulfills his obligation—and there is an obligation to be fulfilled. Responsibility for the control and eradication of tuberculosis of live stock rests not only upon the shoulders of the State live-stock sanitary board and the Bureau of Animal Industry; it rests upon the shoulders of the live-stock owners themselves, and it rests largely upon the veterinarians of the United States. It has been demonstrated to a wonderful degree that all of these forces can work harmoniously together, and that, working in that direction, they can succeed in any undertaking upon which they embark. They have succeeded in this work up to date, and they will succeed from year to year according to the perfection of their organization and the degree of enthusiasm with which they carry on the campaign.

WHY THE BAND PLAYED "DIXIE" AT THE INTERNATIONAL

WHEN the Hereford bull, Point Comfort XIV, won for the South the grand championship for the breed at the International Live Stock Exposition of 1913, many northern people felt that the occurrence was a "fluke" which was not likely to be repeated often.

But the record of the International Live Stock Exposition held at Chicago November 29 to December 6 demonstrated the possibilities of the South as a live-stock producing section in a remarkable way. Nine grand championships were won by breeders south of the Ohio River, as follows: Shorthorn bull and cow, Hereford bull, Aberdeen-Angus bull, Percheron mare, Duroc Jersey boar, Poland China sow, and Hampshire ram and ewe.

Not all of these animals were actually bred on southern farms, but the fact that they were shown from southern herds is an illustration of the progressive spirit of the southern breeders, and those which were bred and raised on southern farms show clearly that the South can produce as fine breeding stock as any other section of the country.

In addition to the winnings in the live-stock judging, the college judging team from the Texas A. & M. College won first in the students' judging contest, and the team representing the Texas agricultural clubs won second by one point only in the noncollegiate judging contest.

WHAT PART SHOULD THE FARM ADVISER TAKE IN THE CONTROL OF ANIMAL DISEASES?

ROBERT GRAHAM in *"The Extension Messenger"*

THIS question has been repeatedly submitted in one way or another by various men in formulating a policy to guide their own activities. Disease control is one of the most important problems of any live-stock producing county, and the farm adviser, in the opinion of the writer, can render a valuable service and mold in a large degree the plan of procedure in many instances.

It is not the function of the county farm adviser to vaccinate animals or to administer treatment, but rather confine his activities to the bigger problem of disease control, by offering pertinent advice to the owner. The danger of buying disease, the need of prompt action on the appearance of the disease, the dollars and cents value of quarantine and farm disinfection, the danger of feeding "cure-all"

medicines and the advisability of calling a veterinarian early are among the important questions in disease control which the Farm Bureau agent can emphasize in his activities.

If veterinary service is indicated in the capacity of diagnosis necessitating autopsy, or in the treatment of animals, it is conceded that this belongs to the qualified veterinarian. In other words, Farm Bureau agents should encourage the employment of the local veterinarian where his services are indicated, with the understanding that the veterinarian will render a professional service for a reasonable fee. It is reported that some veterinarians have overcharged, but these cases are comparatively few, and fortunately live-stock owners have ample recourse by refusing to employ these men.

Under prevailing conditions there is need for the advisory work of the Farm Bureau agent in disease control, but it is obvious that the greatest accomplishment implies cooperation with the local veterinarian and each need assume their responsibility to the live-stock industry without controversy.

LIVE-STOCK IMPORTS FROM ENGLAND PREVENTED BY FOOT-AND-MOUTH DISEASE

THE importation from England of cattle and all other ruminant animals and swine is being held up by the United States Department of Agriculture on account of an outbreak of foot-and-mouth disease in the Isle of Wight. The present ban will be in force until 30 days have elapsed after all the animals exposed to the malady have been disposed of and the contaminated premises have been thoroughly disinfected.

This last outbreak occurred late in October, and is the most recent of several which occurred at irregular intervals in different parts of England during 1919 and 1918. Some of the previous outbreaks have been in Warwickshire and Dorsetshire. At different times the Department of Agriculture has been on the point of resuming importation, when the disease would be discovered in a new region. Dealers have put in applications for permits to import a total of 850 cattle, but have been prevented from doing so on account of this ban. Probably there are many others who have not yet made formal application for permits to the department. All of the cattle to be imported from England are purebreds.

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READJUSTMENT

MORE than a year has passed since the great cyclone raged in Europe, but the winds still blow fitfully. At this writing our country, technically, is not yet on a peace basis. It was slow in declaring that a state of war existed and seems to be equally slow in declaring peace. In the meantime conditions are favorable for unrest and agitation at home, misunderstanding and nervous tension with our former allies, and a certain amount of hopefulness on the part of our late enemies that American statesmen (?) will soften or nullify the work accomplished by the Allied and American armies.

Civilization was placed in jeopardy by the war. It was saved only by the blood and lives of millions of gallant men. Yet there are some proclaiming 100 per cent Americanism who, by their action, after the pus has been drained from the European abscess, prevent disinfection, thereby delaying the healing process, and remain indifferent to the realization that the remnants of pus may in time develop another abscess which may again involve this country in a disagreeable surgical operation.

In union there is strength. If brotherhood and *entente cordiale*

were desirable for the sake of humanity during the war, why should they not continue in time of peace? Whether we wished it or not, our country has become a world power, and it should not evade its responsibilities. Isolation contracts the soul and makes the world unsafe for democracy. We have become a creditor nation in a world upset by abnormal conditions. We have obligations to our neighbors with whom we must continue commercial, political and social relations. These obligations are pressing and insistent. Our neighbors stagger under an overload of debt. Our late enemy must pay, but all he can possibly pay will meet only a fraction of the loss. He has not lost his fields, mines nor factories, but he has lost caste and overseas trade and faces a world which regards him with suspicion or hatred. He has a terrible reputation to live down. What he can earn must go to pay the fiddler to whose deadly music he chose to dance.

We have fought an enemy in the open, but we are still fighting a secret enemy. There are secret serpents sneaking through our land, who endeavor by insidious and seditious propaganda to weaken and destroy our present form of government. Boring from within, they seek to undermine our various lines of industry, paralyze our transportation, kill our traffic, in order that our allied neighbors depending upon us for support may be still further crippled, while our late enemy may become rehabilitated. Under whatever guise their motives may be proclaimed, when carried into effect the result is to aid and comfort the foe and still further cripple the defenders of civilization. Complete victory will not be won until the secret enemies are disposed of. If the American people do not own this country, who does? This nation has been the melting pot for the burdened and the oppressed. Freedom and opportunity have been offered them, but some will not melt. Like vipers they would sting the hand that nourishes them. Let such incompatibles as will not fuse with us be cast aside. If they can not construct our future destiny with us, they must not be permitted to destroy what we have.

Many of the problems of readjustment have been met and settled with surprising rapidity. The demobilization of 4,000,000 American soldiers and their induction into peaceful occupations has been accomplished without undue excitement. The problems are obviously much greater in the zone where the cyclone raged than in more distant zones; but no matter how great the distance, certain problems persist and become intensified when apostles of lawlessness, taking advantage of the unsettled conditions, preach and practice the doc-

trine of hate and of crime. Increased production so essential for our own welfare and prosperity, as well as that of our neighbors, has been retarded or decreased by those who knowingly or unknowingly have played into the hand of the enemy.

The New Year dawns with more peace in Europe than has existed during the past five years. Good will, forgiveness and trust will be of slower development. The forces of destruction have been rapid and efficient; those of construction will be difficult and prolonged. The nightmare has passed, but it has left us shaken and perturbed in arousing to the activities of the day.

The veterinarian as a public-spirited citizen has his share in the general problems of readjustment—he is a citizen before he is a professional man. Veterinarians who have been in the military service have also individual readjustments to make. For two years they have lived in a different atmosphere amid conditions previously undreamed of. In some instances their experiences have unsettled them for the routine work to which they devoted themselves in the pre-war period. In some cases there have been instances of apparent injustice and partiality. Some have returned to better opportunities. Some have returned to find their former practice demoralized or invaded by others. Tremendous difficulties have attended the veterinary service from the beginning to the end of the war, but in spite of insuperable obstacles the veterinarians have made good, and one important factor that has sustained them in their almost superhuman efforts is the realization that the profession stood behind them. They are big enough and have vision enough to submerge personal grievances in the greater results achieved by their united action.

P. A. F.

DEAN AND DIRECTOR DALRYMPLE

THE country of Robert Bruce and "Bobbie" Burns has contributed liberally to the growth and elevation of the veterinary profession in America. Many of our most successful practitioners came from Scotland, and her colleges have prepared some of our most distinguished educators and research workers. Dr. Dalrymple is one of the most prominent Scotchmen of our profession who came to the United States to make a home among us and to be one of us. His many friends throughout the country will be pleased to learn that he has been selected to succeed Dr. W. R. Dodson, whose resignation as dean of the Louisiana State College of Agriculture and director of the Louisiana Experiment Station became effective January 1.

Dr. Dalrymple was born at Stranraer, Wigtownshire, Scotland, April 23, 1856, graduated from the Glasgow Veterinary College with the degree of M. R. C. V. S. in 1886, and sailed for America three years later. Shortly after his arrival in the United States he became identified with the Louisiana State University, where he has remained continuously ever since except for an interval of three years in the nineties which was devoted to study and travel in Europe and South Africa.

Dr. Dalrymple enjoys a high reputation as a scientist, he has been eminently successful as an educator, and is regarded not only in Louisiana but throughout the country as one of the ablest exponents of scientific agriculture and live-stock production. The high esteem in which he is held is evidenced by the honors that have been accorded him by the various medical, live-stock and agricultural bodies with which he has been identified. He served as president of the American Veterinary Medical Association 1907-8, president of the United States Live Stock Sanitary Association 1908-9, member of the Executive Committee of the National Live Stock Association 1902-4, and president of the United States Experiment Station Veterinary Medical Association 1901-2. He was chosen as reporter on anthrax for the United States at the International Veterinary Congress held in London in 1914, member of the International Congress on Tuberculosis at Washington in 1908, and member of the International Congress on Hygiene and Demography at Washington in 1912, and is a Fellow of the Glasgow Veterinary Medical Society.

Dr. Dalrymple has always taken an active interest in State and local matters in Louisiana and has done much to advance agriculture and promote the live-stock industry of the State. He has served his State as secretary of the Louisiana State Agricultural Society and Louisiana Stock Breeders' Association, as president of the Louisiana Veterinary Medical Association and the Louisiana Society of Naturalists, as member of the Louisiana State Live Stock Sanitary Board, and as editor of the live-stock department of the New Orleans *Picayune*. His excellent services as editor of our JOURNAL during the past year are too well known to require further comment. He is the author of a valuable work on veterinary obstetrics and in addition has written various bulletins and contributed to publications many articles relating to agriculture and live-stock matters. His new assignment broadens the scope for continuing his useful activities, and the JOURNAL joins his many friends in wishing him success in his new field.

INTERNATIONAL VETERINARY CONGRESS

AT the recent meeting of the American Veterinary Medical Association at New Orleans a motion was unanimously adopted to invite the next International Veterinary Congress to convene in this country. With the view of initiating a movement to expedite this proposal a committee was appointed by ex-President Moore, and steps have already been taken by Secretary Eichhorn to inquire of Dr. DeJong, the General Secretary of the Permanent Committee at Leyden, Holland, what procedure the A. V. M. A. committee should pursue to bring this matter before the Permanent Committee of the Eleventh International Veterinary Congress. Many members of the A. V. M. A. believe that arrangements could be made to have the Congress meet in the United State in 1921, but should the time for preparing for the Congress be insufficient, we could consider a Congress for the year 1922.

Our Association with its membership of approximately 4,500 would be happy to have the opportunity of entertaining the International Congress in this country. Moreover, aside from the members of our Association, everyone interested in the veterinary profession and in the live-stock industry of this country would heartily support such a movement. While our committee has not as yet approached the Federal Government as to the support we could expect to receive, we are satisfied that the proper authorities will render all the assistance necessary toward the success of such an undertaking when the time is ripe. As soon as Dr. DeJong furnishes information as to the proper procedure for extending an official invitation, appropriate steps will be taken, as it is fully realized that considerable time will be required for the preparation of such an elaborate undertaking.

The members of the committee are Drs. L. A. Merillat, L. Van Es, D. S. White, F. Torrance, C. A. Cary, A. Eichhorn, secretary, and J. R. Mohler, chairman.

NATIONAL RESEARCH COUNCIL

DURING the war the National Research Council, acting as a department of the Council of National Defense, was able to render substantial service to the Government. Established under the Congressional charter of the National Academy of Sciences and organized with the cooperation of the largest national scientific and technical societies of the country, the Council has now passed over

to a peace-time basis. A review of the personnel of the Council will indicate the wide scope of its scientific and technical support and the distinguished scientific character of its divisional chairmen who are resident in Washington.

The Council was organized in 1916 at the request of the President as a measure of national preparedness, and the results obtained were nothing short of marvelous in stimulating research in the mathematical, physical and biological sciences and in the application of these sciences to medicine, agriculture and the useful arts. During the war it was science that enabled America and the Allies to overcome the formidable war effort of Germany, and it will be to science that the world will turn for aid in meeting after-war problems.

The Government Relations Division of the National Research Council met at the Smithsonian Institution on December 19, 1919, Dr. Charles D. Walcott, Director of the Smithsonian Institution, presiding. One of the principal topics discussed was food of both vegetable and animal origin, the latter subject being of special interest to all veterinarians. Our profession was represented by the Chief of the Bureau of Animal Industry, who was appointed a member of the Council by President Wilson on recommendation of the Secretary of Agriculture.

PUBLICATION OF THE PROCEEDINGS

THE proceedings of the first day's sessions of the Fifty-sixth Annual Meeting of the American Veterinary Medical Association at New Orleans appear in this number. It has been the practice heretofore to publish the proceedings in a special extra edition of THE JOURNAL, but that plan can no longer be followed because the Post Office Department holds that such extra numbers are not permissible under the second-class mailing privilege. We have therefore concluded to print the proceedings in instalments in the regular issues of THE JOURNAL. The remaining portions will follow from month to month and the whole will be completed just as soon as available space will permit.

Dr. John W. Scott, Parasitologist of the Wyoming Agricultural Experiment Station, Laramie, Wyoming, is spending the current collegiate year at the laboratories of the Zoological Division, Bureau of Animal Industry, Washington, D. C., in investigations relating to animal parasites.

NOTES ON SWAMP FEVER¹

By S. HADWEN

Chief Pathologist, Health of Animals Branch, Canadian Department of Agriculture, Ottawa, Canada

FOR some time past cooperative investigations on swamp fever in horses have been carried on by the United States and Canadian Departments of Agriculture, and during the course of these investigations Dr. B. H. Ransom and I have made trips into swamp-fever districts in Canada and are also carrying on some experiments at Washington and at Ottawa. It is my purpose at the present time, with the approval of Dr. Ransom, merely to call attention to a few points that have come out in the course of our work.

One of the questions which has perplexed men working on swamp fever has been the presence of worms in the cases, and it has evidently been difficult for them to decide except by blood inoculation whether they were dealing with a swamp-fever case or a verminous one. This has been our experience also. The symptoms presented by a case of gross parasitism apparently resemble closely those of a case of swamp fever.

In 1918 we published a paper on our Canadian worms, giving the locations in which the parasites were found but saying very little about the lesions encountered. Attention was, however, called to the ulcers found in the colon which were associated with, and were evidently caused by, a certain species of nematode, *Triodontophorus tenuicollis*. These ulcers had been previously noticed by Weinberg in France and later by Hartman in Montana. These authors did not identify the particular nematode causing the lesions. At least two other species of *Triodontophorus* are of common occurrence in the colon of horses in America, but so far as we have been able to determine they do not produce ulcers. The ulcers, except for the presence of worms, are very similar in gross appearance to those found in hog cholera, though in some cases are larger and in one or two instances those observed had been close to perforating the bowel, the resulting scar being puckered in appearance.

In addition to these ulcers, worms produce certain other striking lesions which may be mistaken for swamp-fever lesions. In the abdominal cavity many of these lesions are encountered. For in-

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

stance, when the kidneys are removed it will frequently be observed that the adjacent lymphatic glands are hemorrhagic and that the tissues surrounding them are gelatinous. In such tissues we repeatedly found the immature forms of *Strongylus*, which in one case were determined by microscopic examination to be *S. equinus*. In the gastro-hepatic ligament also young worms of this species were encountered, as many as 12 having been found in a single case. On the walls of the abdominal cavity reddened patches resembling bruises may be noticed under the peritoneum. In these patches young *S. edentatus* will be found.

In the descriptions of postmortems on swamp-fever cases given in the literature, intestinal lesions both external and internal are frequently mentioned. In our postmortems nodules and reddened edematous patches, visible on observation of the serous surface, were frequent, as well as petechiæ. The petechiæ are not necessarily caused by worms, but in the nodules and reddened patches worms are usually discoverable. When the large intestine is opened numerous lesions are revealed that are directly attributable to worms. These are due, first, to the young worms that pass a portion of their life history in the intestinal walls, and, second, to the adults of certain species in the lumen of the intestine that attack the mucosa. The larval forms of the Cylicostomes are found embedded in the mucosa throughout the colon and cecum, being most numerous in the cecum and first and second divisions of the colon, sometimes as many as 50 per square inch. Submucous nodules of varying size up to nearly an inch in diameter are irregularly scattered throughout the course of the large intestine. These contain a yellowish or bloody serum and a larval worm. As the nodules become older the contents become less fluid and take on a yellow cheesy consistency, finally becoming calcareous. In such nodules dead and degenerated parasites may be found. Commonly the undegenerated nodules have a definite circular opening into the lumen of the intestine through which the contents including the larva may be squeezed by applying pressure.

In addition to the ulcers caused by *Triodontophorus tenuicollis*, which occur in the fourth division of the colon near the mesenteric attachment, the bites of the three species of *Strongylus* are very noticeable. The principal places in which these bites occur are in the cecum at the blind end, where *S. vulgaris* is most numerous; in the cecum and first division of the colon in the neighborhood of their juncture are other bites caused by *S. edentatus* and *S. equinus*,

and in the first division of the colon bites caused by *S. edentatus*. The bites correspond in shape and size to the buccal cavity of the worms, those of *S. edentatus* being the largest and those of *S. vulgaris* the smallest. They are small, round, red spots raised above the surface of the surrounding mucosa and comprising the portion of the mucosa that was sucked into the buccal cavity of the parasite.

To sum up the lesions observed in many of the postmortems so far as concerns the interior of the large intestine, there is a general spotting of the mucosa, the very small dark spots being larvæ in the mucosa, somewhat larger bright red spots being the bites of strongyles, and larger irregular blotches which may be caused by the parasites; however, as similar blotches may occur in the small intestines in the same animal without evident association with parasites in that region of the bowel, it is not at all certain that these are directly due to parasites. The spotting of the intestinal wall together with the nodules, edematous patches and ulcers are the main lesions of the intestine caused by worms. Finally may be mentioned the exudate, a grayish, sticky, evil-smelling mucus covering the mucosa of the large intestine of animals in a moribund condition, and dried feces often adherent to the mucosa of the third division of the colon. This condition has been noted especially in those cases in which there was a high degree of infestation with worms. Commonly the worms in this exudate were very sluggish or dead.

In connection with heart lesions in swamp fever the hemorrhagic spotting of the endocardium frequently described as a typical lesion of the disease has been a very constant lesion in the cases we observed in the field. It is an interesting fact that in a number of apparently healthy horses experimentally injected subcutaneously with fresh juices of worms or extracts of dried worms or bots the heart was found on postmortem to show lesions very similar to those observed in swamp-fever horses. Such lesions have also been seen by various observers in conditions other than swamp fever. It would seem that heart lesions by themselves are not sufficient to establish a diagnosis of swamp fever.

Another difficulty in separating swamp-fever cases from cases of verminous infestation is in the fact that edemas of the abdomen, breast and limbs are common to both conditions. In concluding these brief remarks concerning the lesions that we have observed in swamp-fever cases complicated with verminous infestation, it should be stated emphatically that there is no actual evidence that worms

have anything to do with swamp fever, though it is not impossible that the injurious effects of worms are greater in animals that are suffering simultaneously from swamp fever. That the cases we observed in the field were in fact swamp fever was proved in several instances at least by blood inoculations into experimental horses. Experiments in feeding to horses the infective stages of parasites contained in cultures of feces from swamp-fever horses were in every case negative. Likewise, injections of worms taken from horses suffering with swamp fever failed to reproduce the disease. The only possible exception was the case of one horse which showed the first symptoms of swamp fever five months after inoculation. As this animal had in the meantime been more or less associated with horses affected with swamp fever, no serious importance can be attached to this result, notwithstanding the fact that the disease appeared in the early spring, whereas the disease naturally appears in the late summer and early autumn.

With reference to the blood, in the cases that we studied, smears were taken from a large number of the animals, and differential counts of the leucocytes were made. The blood picture which has been repeatedly described by various workers including Van Es, Harris, Schalk, Theiler, Mack and others shows in the first place that the mononuclear leucocytes are increased, and we have found them sometimes practically as high as 100 per cent, commonly 60 to 80 per cent. This increase in mononuclears is undoubtedly an important point in connection with the diagnosis of the disease. In moribund cases, however, it may be observed that the polynuclears increase in numbers and may come back almost to normal, the mononuclears being correspondingly reduced. The eosinophiles in many cases were noted by us to be diminished in number and sometimes altogether absent from the peripheral blood. This fact has been observed by others without special comment. This diminution may be due either to a displacement by other cells that are increased in number, or perhaps to the withdrawal of the eosinophiles from the general circulation and their local accumulation in certain organs and tissues, especially in lesions produced by parasites. As an example of such local accumulations, smears made from verminous ulcers in the colon show eosinophiles in enormous numbers. The same is true of the tissues surrounding the parasites in other locations.

In connection with the eosinophiles it is of interest to note that Weinberg and Seguin have shown that the eosinophiles apparently

play a part in the protection of the organism against parasitic invasions, particularly in the neutralization of verminous toxins. In fact it has been demonstrated that bacteria bathed in verminous juices are picked up by eosinophiles, indicating that these cells become phagocytic to bacteria because the verminous substances render them attractive to the eosinophiles, stimulating the latter to phagocytic activity. Whether the number of eosinophiles in the general circulation could be raised artificially was tested experimentally by us, by injecting verminous juices or extracts of dried worms subcutaneously into healthy horses. The results showed that the percentage of eosinophiles frequently increases after such injections. In one instance they increased to 20 per cent from an original percentage of 6.8. This high percentage was found three days after the second injection of verminous material. In horses the normal percentage of eosinophiles appears to be about 3 or 4 per cent, and natural eosinophilias as high as 20 per cent are very rare. Natural eosinophilias in the horse are thus of a lower percentage than those commonly observed in other animals suffering from parasitic infestation. The statements frequently made as to eosinophilia in horses infested with parasites are somewhat misleading, as in gross infestations the percentage may be very low, especially if the parasitism is complicated with swamp fever.

In conclusion it may be stated that from our experience thus far we have found no evidence of a definite relation between parasitic worms and swamp fever. On the other hand we believe that in the study of swamp fever it is very necessary to give careful attention to the parasitic conditions that complicate the disease, otherwise misleading and false deductions are very liable to be made.

DURING Dr. Mayo's recent visit to Havana, he called upon Dr. Etchegoyan, Dean of the Veterinary School of the University of Havana. This school was established under the second American intervention, and Dr. Mayo was one of the board appointed by the Governor to examine the applicants for professorships in the college. The veterinary school does not appear to be making great progress on account of the lack of appropriations, and there are practically few opportunities for clinical instruction. A few senior students were taking advantage of Dr. Etchegoyan's private hospital for practical clinical work.

The Agricultural Experiment Station with which Dr. Mayo was formerly connected is doing very little work along scientific lines.

A COMPARATIVE STUDY OF THE LONG BONES IN INFECTIOUS EQUINE ANEMIA AND OTHER CONDITIONS¹

By LEWIS H. WRIGHT

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NEARLY all of the investigators of the disease of equines known as infectious equine anemia, equine anemia, infectious anemia, swamp fever and other names have drawn particular attention to the changes occurring in the marrow of the long bones, especially the humerus and the femur. The following references are typical of the many articles that have been written regarding these changes.

Hutyra and Marek² say in part as follows:

"Conspicuous and constant changes are present in the bone marrow. In the proximal long bones of the extremities, especially so in the bones of the upper thigh or upper arm, the bone marrow is changed, either for its entire length or only in parts, to a dark brownish-red or blackish-red mass. In the cases with slower course only various sized circumscribed areas are found in the fat marrow or this may appear normal. At the same time, however, the spongy bone marrow shows the above changes or at least a reddish discoloration. The spongy bone marrow of the vertebræ, ribs, etc., manifests similar changes. Even in the most chronic cases at least small hemorrhages are found, which, however, appear of a peculiar ink-black color if of earlier origin. This condition of the bone marrow does not result from hemorrhages, but represents, as in older losses of blood in general, only a regenerative process, and consists in an increased activity of the blood-forming elements of the red marrow areas, the normal occurrence of which in the fat or gelatinous marrow, especially in the femur and humerus, was already indicated by Skiba."

Udall and Fitch³ describe the condition of the bones as follows:

"Bone: On sectioning, the long bones, particularly the femur and humerus, show the most pronounced lesions. In the proximal ends of these bones the bone marrow is changed either wholly or in circumscribed portions. These areas are either a reddish brown or a bright red. The spongy bone marrow of the ribs, vertebræ, etc., show similar changes."

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

² *Hutyra and Marek*: Special Pathology and Therapeutics of the Diseases of Domestic Animals. Authorized American Edition, translated by Mohler and Eichhorn; Vol. I, 1916, p. 924.

³ *Udall and Fitch*: Preliminary Report on the Recognition of Swamp Fever or Infectious Anemia in New York State. Cornell Veterinarian, Vol. V, No. 2, p. 73.

They also state that "these areas are not hemorrhagic as might be supposed, but are due apparently to an increased activity of the blood-forming elements in the bone marrow."

Mack⁴ states that "the changes in the bone marrow in fatal cases are profound and constitute a complex subject." In one case he found "the marrow in the ribs, vertebrae and pelvis very much darker in color than is that in healthy horses. The marrow in the shafts of some of the long bones was a deep, dark red in color. This condition was marked in the humerus, intense in the femur."

In another case he notes:

"The changes in the bone marrow were profound. The occipital, vertebral, and pelvic marrow was much darker than normal, the scapular somewhat so. The costal marrow seemed normal. In the femurs the greater part of the proximal and much of the distal ends and the marrow in the shafts was a very dark red in color. That in the tibiae was similar to the femur except that the color was less intense. In the humerus portions of the ends and the greater part of that in the shaft were dark red; there were some yellow areas in the shaft, and a yellow margin about 1-1.5 cm. deep under the articular surfaces, beneath which it was very dark. The radius was similarly affected, but less intensely, the metatarsus slightly so."

Van Es, Harris and Schalk⁵ say:

"It is possible that the bone marrow lesions constitute a valuable aid in the postmortem diagnosis of the disease, but in view of the fact that we know comparatively so little of bone marrow changes in connection with other diseases of the horse, or even under varying normal conditions, we would rather suspend judgment relating to their diagnostic value until the matter has been looked into more fully."

In some cases they found hyperplasia, in others hemorrhages of the marrow.

The Japanese Commission⁶ found that the "changes of the bone marrow are very marked next to those of the blood. In the acute cases the cross section of the long bones, such as the femur and humerus, shows that the bone marrow changes wholly or in part into dark red with petechiae. In the chronic cases, the change is not so extensive as in the acute form, but it develops as the foci. In the protracted cases a small number of foci are invariably present."

⁴ W. B. Mack: Equine Anemia. Bulletin 68, Nevada Agricultural Experiment Station.

⁵ Van Es, Harris and Schalk: Swamp Fever in Horses. Bulletin 94, North Dakota Agricultural Experiment Station.

⁶ Japanese Special Commission: Report on the Results Obtained by the Special Committee for the Investigation of Infectious Anemia Among Horses. Horse Administration Bureau. Tokyo, 1914.

Theiler and Kehoe⁷ undertook the study of the bones in this and other conditions. This study was prompted by the "fact that some writers describe the bone marrow in this disease as presenting changes or appearances which may, to a certain extent, be regarded as characteristic of the condition, and especially when other lesions present on autopsy are only those of a septicemic nature or where, for other reasons, the existence of the disease was suspected." After discussing the findings of various authors they state:

"In view of all the above evidence, we therefore considered it advisable to examine the appearance of the bone marrow, not only in cases of animals dying of infectious or pernicious anemia, but also in the case of those which died from other causes or were killed. In a number of animals, therefore, the bone marrow of the humerus and the femur was specially examined with this object in view, and it must be here stated that the results obtained do not allow us to regard the marrow of animals dying of pernicious anemia as presenting any specially characteristic appearance, since exactly similar appearances are to be met with in animals coming to autopsy as a result of death from a large variety of other causes."

Text books of anatomy, physiology and embryology make no mention of the extent of the red marrow in the long bones so far as search of the available literature discloses. Theiler and Kehoe⁷ are apparently the only investigators who have published the results of a study of the normal long bone marrow or long bone marrow from the various disease conditions of equines.

The positive diagnosis of infectious equine anemia from general symptoms and autopsy lesions being an impossibility in many cases, it was thought that because so much stress had been placed upon the marrow changes in this disease there was a possibility that these changes might be characteristic. The paucity of literature on the subject made it seem advisable to undertake the comparative study of normal bones and those found in various disease conditions.

These observations were made principally on the femur, humerus and ribs. Other bones, as the radius, tibia, vertebræ, metacarpus, metatarsus and phalanges were observed, but because of their lack of marrow space, as a whole the changes in them are naturally of less importance.

The bones were removed from the carcasses as soon after death as possible. If not sectioned at once they were placed in the refrigerator to retard postmortem changes. Most of the sections

⁷ *Theiler and Kehoe: Infectious or Pernicious Anemia of Equines in South Africa. Third and fourth reports of the Director of Veterinary Research, Union of South Africa, p. 269.*

were made longitudinally, attempting to cut directly through the center of the shaft of the bone. Then the cut surface was carefully cleaned of debris and the colored reproductions were made immediately. The smears were made from various portions of the marrow and stained by Giemsa's method.³

An attempt has been made to show by these reproductions that many other disease conditions may give a bone marrow that is almost, if not quite, identical with that found in equine anemia cases. It has even been shown that the marrow may be darker in color and more extensive in normal horses than it is in some equine anemia conditions. As for the so-called "embryonic marrow," the nearest approach to this condition that has been found, other than in two colts, was in a case of septicemia. In this case the marrow was of a jam-like consistency.

Considering the fact that the bone marrow is the seat of the formation of red blood cells in the adult, one would expect to find a very active marrow in such conditions as equine anemia, hemorrhage, blood parasites, etc., provided the proper reproductive power of the blood-forming elements was not interfered with. It is possible that there is a direct relation between the reproductive powers of the marrow and the acuteness of the diseases, the degree of the latter being, perhaps, largely due to the failure of the marrow to rapidly increase its production of red cells. The more acute cases here shown have had less red marrow than the more chronic ones. There are also found more normoblasts in the blood in the cases of several weeks' duration than in the very acute ones.

Only a few smears from the marrow have been made, but there is an apparent increase in the activity of the marrow in conditions where there is a loss of red cells. This was especially noticeable in the smears from the horses which were bled. As the references have stated, the increased redness, if there be any, is usually hyperplasia rather than hemorrhage.

³ At this point Dr. Wright showed a large number of projectoscope pictures of beautiful colored reproductions of the long bones of horses both in health and disease. Of particular interest were the bones from cases of sel rotoniasis, acute experimental equine anemia, and chronic natural cases of equine anemia.—EDITOR.

EXPERIMENTAL TRANSMISSION OF SWAMP FEVER OR INFECTIOUS ANEMIA BY MEANS OF INSECTS¹

By JOHN W. SCOTT

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THIS very insidious, obscure, and important disease of equines, of very wide geographical distribution, and known for more than three-quarters of a century, still furnishes many elusive problems yet to be answered.

1. What is the real nature of the virus? Is it a protozoan or a bacterium, or does it belong to that group of organisms that are not distinguishable as either plant or animal?

2. The virus is evidently capable of reproducing by some method within the horse's body. Is it also capable of reproducing by another method outside of the body of equines?

3. In accordance with a common popular belief, is the virus capable of living free and reproducing independently of any warm-blooded animal?

4. Or has the habit of parasitism become so fixed that horses' or asses' blood is absolutely necessary in order to complete the life history of the organism?

5. Is the blood of a swamp-fever case equally virulent at all times in the course of the disease?

6. We know something of the factors that apparently decrease the virulence of the organism. What are the conditions that increase its virulence?

7. As suggested by some writers, does the amount of virus inoculated bear an inverse relation to the length of the incubation period?

8. Is the virus present at all times in the urine, or only at certain intervals?

9. Does the virus have any other avenue of escape from the body?

10. What are the best measures to take for controlling and eradicating the disease?

These and many others are all questions worthy of consideration, investigation and elucidation.

At the Wyoming experiment station we have confined most of our work to an investigation of methods of transmitting the disease.

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

Considering our present information in regard to the nature and the life cycle of the virus, it is believed that a better knowledge of the possible methods of transmitting swamp fever affords the best and surest means of satisfactory control. When the writer took charge of the work his predecessor, Dr. L. D. Swingle, had made numerous attempts to transmit the disease by feeding various quantities of blood and urine that came from horses infected with swamp fever. He had obtained uniformly negative results, even though large quantities of blood and urine were sometimes used. A study of the literature revealed the fact that while some investigators had succeeded in transmitting the disease by feeding blood or giving food or drink contaminated with infective urine, it had always been a difficult matter. The quantities required for infection were also very large as compared with the quantity required for inoculation through the skin; in fact the quantities were much larger than a horse would likely obtain in a whole lifetime under natural conditions. This work showed the difficulty invariably experienced in attempts to inoculate the virus through the alimentary canal. The current theory, first proposed by Carre and Vallee, that natural infection occurs as the result of contaminating food and drink with urine from diseased horses, did not seem to be an adequate hypothesis to explain the spread of the disease.

From this study, considering what was known of seasonal infection and the history of epidemics, we came to the conclusion that it did not seem possible to account for all transmissions on the urine-contamination theory. The following question then arose: If transmission by way of the alimentary canal was inadequate to account for all cases of transmission, was it possible to obtain transmissions of the disease by any other method? Were there any possible or probable natural methods by which the virus could be inoculated through the skin? From that time (1913) we decided to confine our investigations, for a while at least, to the problem of external transmission.

External transmission or inoculation may be conceived of as possible by means of (1) abrasions, scratches or cuts in the skin or (2) by means of certain agents or vectors actually carrying the infective blood from one horse to another on the mouth parts, such as is known to be true of certain biting insects. Cuts, scratches and abrasions were at once excluded as possible avenues of infection on account of their accidental character and because they do not conform in incidence to the seasonal distribution of swamp fever.

On similar grounds it was found that lice, scab parasites and ticks could be eliminated from the list of possible carriers of the disease. So if external inoculation of the virus was a natural method of propagating swamp fever the only agents left, in Wyoming, were certain biting flies and mosquitoes. Accordingly in the spring of 1914 we began the series of tests which has led us to some very interesting results.

Space does not permit me to give the details of our experiments in this report. Those interested will probably find a full account published later in the *Journal of Agricultural Research*. Some phases of the work have already been published in Bulletin 121 of the Wyoming Agricultural Experiment Station. I shall give here only a general summary of the experiments together with the results obtained.

EXPERIMENTS WITH MOSQUITOES

A screen cage was constructed capable of holding five horses. Aquaria were introduced and stocked with larvæ and pupæ. Later wild adult mosquitoes were caught and put into the cage. A chronic case of swamp fever was then put into this screened cage for a few days. Mosquitoes were observed to bite him freely. Next the diseased horse was removed and three well horses were introduced and allowed to remain for a considerable period. The three well horses gave no evidence of taking the disease either at this time or later.

A second experiment was tried the following year in which swamp-fever horses, well horses and mosquitoes were all kept in the cage at the same time. Only negative results were obtained.

While not conclusive, the results of these experiments led us to believe that mosquitoes do not ordinarily act as agents in transmitting swamp fever. Accordingly our attention was turned in other directions.

EXPERIMENTS WITH BITING FLIES

A preliminary experiment was described some years ago. Two sick and three well horses were confined in separate stalls in a screened cage. A great many flies including house flies, stable flies and numerous species of wild flies were captured and put in with the horses. The house flies (*Musca domestica*) and stable flies (*Stomoxys calcitrans*) thrived and propagated in great numbers; the other wild flies very quickly died and disappeared. Two of the well horses became infected with swamp fever, one developing into an acute or a semi-acute, the other into a chronic case. Since house

flies do not bite, and since the other wild flies quickly died, it was concluded that the *stable flies were probably responsible for transmitting the disease*. Of course this experiment did not avoid the criticism that the transmission may have taken place by contamination.

OTHER EXPERIMENTS WITH STOMOXYS

Near the end of the season in 1914 a second screened cage was hastily constructed and three well horses were confined in it. Many hundred flies, some of which had undoubtedly bitten the diseased horses, were then taken from the first cage and put in with these horses. One of the well horses gave a mild reaction which developed into a severe case of swamp fever by the following summer.

It was next determined to test the insect hypothesis of transmission in a more crucial way. A third screened cage was constructed similar to the first. Three horses with swamp fever were available for experiment. These were kept going in rotation through the two cages so that both cages were exposed alike to contamination. Three well horses were kept in one cage and two well horses in the other. Stable flies were introduced and raised in the first cage, and except for an occasional house fly the other cage was kept fly-free. Two out of three of the well horses in the cage with stable flies took the disease, while neither one of the two well horses in the other cage gave evidence of becoming infected with swamp fever. This experiment seemed to prove that the stable fly and not contamination was the means of transmitting the disease.

The following season, in 1916, after a thorough cleaning of the two cages, horses with swamp fever were confined exclusively to one cage and well horses to the other. Stable flies confined in small, boxlike screen cages were exposed to and allowed to bite the backs of the diseased horses; they were then carried to the other cage and in a similar way allowed to bite the back of a well horse. This horse developed a mild chronic case of swamp fever which, after two years, resulted fatally. This same method of procedure has been used on three other horses. One died by accident before the result was known, one developed a chronic case which is still running, and the other failed to give any clear evidence of infection.

From these experiments we concluded that *Stomoxys calcitrans* is capable of transmitting and probably does act as a vector in spreading the disease known as infectious anemia or swamp fever, especially if the flies are present in large numbers and the conditions are favorable for interrupted feeding.

EXPERIMENTS WITH TABANUS

The only species of Tabanidæ we have found available in sufficient numbers for experiment on the Laramie plains is *Tabanus septentrionalis* Loew (identified by Dr. J. S. Hine). By using small screen cages and the interrupted feeding method as described for the stable fly in 1916, three horses were used, one in 1916 and two in 1917. The old mare used in 1916 developed a mild chronic case that resulted fatally after about 15 months. Of the two horses used in 1917, one died within a month after developing a severe case of swamp fever, while the other failed to become infected.

From these experiments it seems entirely probable that Tabanids, particularly *T. septentrionalis*, are also capable of transmitting swamp fever.

EXPERIMENTS WITH INFECTIVE NEEDLE

If it is true that certain biting flies are capable of transmitting the disease known as swamp fever, then the inoculation of a very small amount of the virus ought to produce the disease, at least in some horses. With this idea in view a medium fine hypodermic needle was used to pierce the skin of an infected horse in one cage and, without disinfecting, was then used to pierce the skin of a well horse in the other cage. Two horses were used. One of these developed a mild case in which the horse apparently fully recovered. The other failed to become infected. So far as it goes, this result tends to confirm the results obtained with insects, for the amount of infecting material clinging to a hypodermic needle as it pierces the skin is probably no larger than that adhering to the mouth parts of biting flies.

CONCLUSIONS

This gives a general summary of some of the principal experiments we have tried with insects in transmitting swamp fever. It is believed that they afford conclusive proof that certain biting flies, *Stomoxys calcitrans* and *Tabanus septentrionalis* in particular, are capable of transmitting infectious anemia of horses.

As the result of pasturing and penning experiments the Japanese Commission in 1914 came to the general conclusion that probably certain Tabanidæ were responsible for transmitting swamp fever. I understand that Dr. Ransom of Washington has repeated similar penning experiments with similar results. Our own experiments have been more specific and, I believe, more conclusive than those of the Japanese.

SUGGESTIONS FOR CONTROL

If we accept as a fact the hypothesis that stable flies and certain horseflies are capable of transmitting swamp fever, certain measures of control acquire added importance. It is evident that we can take no adequate measures of control aimed directly at the parasite that produces swamp fever, for the reason that the organism has not been found. It is also impossible so far to build up an artificial immunity in uninfected animals, and no methods of treatment reach the organism that produces the disease. Consequently any measures we may take for satisfactory control should include the following suggestions:

1. All known cases of swamp fever should be immediately killed or carefully isolated. This is particularly important during the season when biting flies are most abundant. Since many of the infected horses will die anyway, and the remainder act as carriers of the virus, it is usually best to kill all serious cases at once in order to avoid the expense of their care and feed. All dead infected horses should be carefully burned or deeply buried.

2. If the affected cases are not killed at once, all well horses should be segregated from the sick or suspected horses, so that biting flies do not readily pass from one to the other. Suspected cases should then be carefully watched for a lengthy period until the diagnosis is verified or disproved. The isolation of affected horses probably should be permanent, but is of greatest importance during the infective season.

3. Since the incubation period may vary from a few days to several weeks, and probably in some cases several months, it is highly important that a careful watch be kept over all horses that have been exposed to infection. Daily temperatures should be taken, and if a horse shows sudden fever or any other symptom of the disease it should be isolated for further observation.

4. The chronic or healthy carrier probably affords the most important method of spreading the disease from one district to another. The detection of such carrier is the most difficult problem in the control of swamp fever. After they are discovered under no circumstances should they be sold or allowed to be taken from one ranch or district to another.

5. As a control measure, it is without doubt best to suspend all movements or shipments of horses from a swamp-fever area during and for some time beyond the infective season. Horses in poor condition, or suspicious cases, should not be moved from an infected

area at any time. Ranchmen and farmers should likewise exercise great care in buying new horses from an infected area. If horses are purchased from such an area they should be kept apart three months or more for observation before turning them in with horses that are known to be free from the disease.

For further explanation and suggested measures of control the reader is referred to Bulletin 121 of the Wyoming Agricultural Experiment Station.

Dr. Emile Eyquem of Santiago de Chile was a recent visitor in Washington, where he spent 10 days in reviewing the activities of the Bureau of Animal Industry. Dr. Eyquem was attending the International Veterinary Congress in London when the World War broke out. He immediately offered his services to France, the birthplace of his parents, and served throughout the struggle and with the Army of Occupation on the Rhine. He is now en route to Chile, where he will assume charge of that Government's work in the control and eradication of contagious diseases. His interest in having the next International Veterinary Congress in the United States was very marked, and a large delegation from South America was promised.

Dr. W. H. Lynch of Portland, Maine, was recently appointed State Live-Stock Sanitary Commissioner by Governor Carl E. Millikin, for the ensuing term of four years, and has moved to Augusta. Dr. Lynch succeeds Mr. B. B. Bearce and is the second veterinarian to hold this position in the State's history. Wearing three service stripes, Dr. Lynch returned to New England from France last spring, a veteran of the 26th Division in the World War.

Warm letters of congratulation containing gratifying assurances of support have been received by Dr. Lynch from veterinarians of every section of the State.

Dr. F. W. Chamberlain, East Lansing, Mich., was recently made Dean of the Division of Veterinary Science. Michigan Agricultural College, vice R. P. Lyman, who had served in that capacity since the organization of this veterinary school. Dr. Lyman still resides at East Lansing, but is now associated with a large mortgage and bonding corporation of Lansing. The JOURNAL wishes both Drs. Chamberlain and Lyman much success in their new undertakings.

IMPACTION IN THE HORSE¹

By H. A. TRIPPEER

Walla Walla, Wash.

IN the extreme Northwest the prevailing food for horses is wheat hay, straw or alfalfa. Grain consists of barley or oats.

Forty per cent of my practice is gut trouble. The probable reasons for such a high proportion of such ailments are many animals on ranch, big teams, unbalanced ration, feeding or watering at improper time, and insufficient water or feeding without water when animal is tired. In stock other than work stock it may be due to too much feed and insufficient exercise, in addition to unbalanced ration.

When fed straw or run to straw in winter months, 80 per cent of cases of impaction are of the cecum, 5 per cent of diaphragmatic flexor of great colon, 10 per cent free end of great colon, and 5 per cent floating colon and rectal ring impaction. When barley is fed as a concentrate with any of the above rough forage, cases of diaphragmatic pack are increased and those of the cecum decreased. When alfalfa is the sole rough forage and no concentrates are fed 85 per cent of packs are of floating colon and rectal ring, 10 per cent of free end of great colon, 3 per cent diaphragmatic, and 2 per cent of cecum. If barley is fed, diaphragmatic flexor packs increase and floaters decrease.

Quarters to my liking are stalks and cold-water hydrant, circular box stall 22 feet in diameter, earth floor saucer shaped (center of floor 30 inches lower than outside edge), rings in wall for holding patient at desired angle, and rawhide mat 2 inches thick by 24 by 48 inches, also plumbers' friend slipped over an inch hose.

All diagnoses are made per rectum. Subject is led into stalks, slings put on, temperature and pulse taken, membranes of oral cavity and expression of face observed. I scrutinize exterior of patient for trauma, rupture, etc. If patient is flatulent, paracentesis is performed. After reduction has been accomplished the tail is gently pulled to the left with left hand and anus is lubricated with some good soap in right hand. The cold-water hose is now inserted and water allowed to run in at about 1 gallon in 30 seconds. This is continued for 3 to 5 minutes, a sufficient time to empty completely

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

and balloon the rectum. Then tail is changed to right hand and operator steps to right side of median line of patient and inserts left hand into rectum in search of offender.

If rectal ring is clear, pass hand through ring and as far as possible into the gut, being on the alert for anything that hampers your entrance. If after passing through rectal ring your course is directed to the left and ballooned with water, look for an obstruction in posterior third of floating colon. If the gut seems to be collapsed and your attention is attracted by a cord two or three inches in diameter running from right lumbar region to the left downward and forward, you are likely to find obstruction in anterior two-thirds of floating colon. By applying gentle traction on cord just described you are usually able to pull gut back to where it has the same touch as if it was in posterior third. When this is accomplished gently stroke the hand to the right as far as possible, then suddenly release this hold and attempt to pick up something in abdominal floor just to left of median line. If you were successful and picked up the offending mass, gently bring it back to brim of pelvis; hold it loosely in this position for a few moments, then gently carry it to right and up, and then slightly retract the hand, and you have the pack in pelvic cavity, ready to massage.

If the pack can not be readily located in this manner, take the subject to a box stall, cast on left side, crossing two front and right hind leg, leaving lower hind leg loose; pull animal to desired slope, and proceed as before.

After the mass has been fixed into pelvic cavity I select the most feasible spot for my massaging process, using first joint of thumb on left hand to press groove in the mass, the fingers of same hand to fix gut. After some experience one can readily locate point of least resistance. My first aim is to get a groove worked longitudinally; if when this is accomplished one can feel the gas passing between fecal mass and gut wall this is very encouraging, as you may leave the patient for two or three hours, as you have relief right then; but be sure to keep the gut posterior to the pack moderately filled with cold tap water. Usually when your next treatment is given you can detect a decided softening in the groove; when this is so I am soon able to break it horizontally. If it is extremely obstinate and the subject be a female, the mass is held in pelvic cavity with left hand and massaged with right through vagina; but if it is a male and the rectum is so that you can work both hands in

the rectum, do not do this, as the strain on the gut is too strenuous and produces paresis of the gut.

Just stick to the job and use the hand that is best educated to this work, being careful not to let the thumb slip off when pressure is applied.

After the mass has been broken up there is usually a three-cornered piece that will need cold-water douches and stimulants, such as:

Sodii chlorid.....	60.0
Saccharum	60.0
Nux vomicæ pulv.....	6.0

Give every 4 hours in warm water per orum.

In free-end impactions of great colon, massage longitudinally. Cast, cross tie all four feet, and rotate so as to massage all surfaces of free end. Use same stimulants as in floating colon troubles.

In diaphragmatic and colon-head obstruction use:

Sodii chlorid.....	60.0
Saccharum	60.0
Nux vomicæ pulv.....	8.0

Administer per orum in quart of hot water every 3 hours until 5 doses have been given. Follow this immediately with arecolin $\frac{1}{2}$ grain; in 15 minutes follow with $\frac{1}{4}$ or $\frac{1}{2}$ grain, according to action you are getting.

In impaction of cecum, cast animal on right side and cross tie two front and left hind leg, leaving right hind leg loose so that it pushes head of cecum nearer to center of cavity. Massage with ball of fingers and heel of hand. Give same stimulants as for great-colon impactions, 18 to 24 hours. Then give 5 cakes of yeast in 3 gallons of warm water with stomach tube. In 30 to 45 minutes give arecolin as in great-colon trouble, if flatulency is not pronounced; if so, tap. If pain is severe for 10 minutes at a time wait until pain subsides to give arecolin. Withhold stimulants for 6 hours, massage, and repeat stimulants.

GENERAL OBSERVATIONS

It is practicable and absolutely necessary to cast and tie a high per cent of subjects.

When the subject is 1 year old or over and normal in size, has not been previously treated in any manner, pulse under 90, temperature less than 106° , a practitioner skilled in this line can break down and save 95 per cent of floating colon impactions in females and 90 per cent in males.

The reason for females being more favorable is that the operator can use both hands on obstruction, right hand in vagina and left hand in rectum. It is not possible to injure wall of vagina if it has been douched with cold water. All enemas should be at a temperature of 50 to 60° F. The gut will stand many times the manipulating and subject will not strain. In some subjects, especially young, I may have an abrasion on left side of rectum from elbow pressure. This is not troublesome; cold water douches t. i. d. will handle it. In 12 years' practice I have handled 3,600 gut troubles and never ruptured a gut by rectal manipulation.

Twenty per cent of cecum packs and 80 per cent of diaphragmatic and colon-head packs are fatal.

A long arm is unnecessary to be successful in this work, but a small hand is indispensable. A large hand and unsensitive touch may mean death to the subject. An operator with long radius can not make the flexion necessary to elevate pack into pelvic cavity.

Let the subject have free access to water. A small dose of arecolin will stimulate thirst many times. Get all the water possible into subject per orum and rectum.

Do not feed any until obstruction has been removed and three or more normal evacuations have taken place and plenty of water has been consumed; then only hay for 3 to 5 minutes at a time; repeat in 3 or 4 hours; gradually increase up to 3 or 5 days before returning to full feed.

No exercise should be given except in cases of cecum pack, and they should be galloped to a sweat before second stimulant treatment is commenced. No other medication has been efficient in my hands.

The floating colon will allow 15 to 18 pounds pressure from ball of thumb.

BELGIAN VETERINARIANS

THE Belgian veterinarians who return to their prewar residence or to a neighboring locality may obtain from the Belgian Ministry of Agriculture an advance of 10,000 francs on account of the war damages due them. In addition they will receive a monthly indemnity of not more than 500 francs. This indemnity is subject to progressive reduction in the proportion that they find resources in the exercise of their profession.

DIAGNOSIS OF BOVINE CONTAGIOUS ABORTION¹

By C. P. FITCH

University Farm, St. Paul, Minn.

THE diagnosis of an infectious disease can usually be divided into three main procedures: (1) Physical examination, including a careful inquiry into the history of the outbreak; (2) laboratory and clinical tests; (3) postmortem findings. In many cases one of these procedures carefully carried out gives definite results, but there are instances when all three are necessary in order to establish a definite diagnosis. The diagnosis of hog cholera, for example, is almost always made on the basis of history, symptomatology and autopsy findings. The practical value of the laboratory tests in the diagnosis of hog cholera is slight because of the long time necessary in order to get positive results as well as the expense of the procedure. Rabies, however, often if not usually requires laboratory procedure in order to determine positively the presence or absence of the disease.

The diagnosis of contagious abortion for many years was shadowed in obscurity. This was due to several conditions, the principal one being the failure to recognize the etiological agent. The eating of spoiled feeds or plants affected with different molds or fungi which were thought to have a specific action on the uterus was considered to be responsible for many abortions. Mechanical injury or so-called accidental abortion was considered the cause of many of the failures to produce a living calf at full time. Due to the researches of Bang, McFadyean, Williams and many others we have gradually come to recognize that abortions due to other than infective agents are few and the losses resulting from such abortions are in the aggregate trivial. Therefore, the diagnosis of abortion has simplified itself in at least one respect, namely, that the losses resulting from this disease are due to the action of a specific infective agent.

On the other hand we have learned that the act of abortion is simply one symptom of the disease. Pathological changes in the various genital organs, causing various forms of sterility, have been shown to be due in a large measure to the ravages of this infection. White scours and calf pneumonia have also a close association with this

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

widespread disease. The problem of the diagnosis of this disease has simplified itself in one way only to become exceedingly complicated in another.

It is the purpose of this paper to discuss the various methods which can be used in the diagnosis of this infection and to attempt to point out the relative value of each so far as we are able in the light of our present knowledge. It must be kept clearly in mind that in many phases of the disease our knowledge is very imperfect and that various research workers are contributing continuously to the literature on this infection.

SYMPTOMS AND HISTORY

The symptoms of an impending abortion are varied. Sometimes abortions occur without premonitory symptoms. This is especially true when the abortion occurs early in pregnancy. The small fetus is discharged with its membranes and nothing unusual is noted until the cow comes in heat. The usual prodromal symptoms are swelling of the vulva, more or less edema of the udder and distention of the teats. The mucous membranes of the vulva and vagina are reddened and a glairy mucus in considerable quantities smears the external vulva and tail. Sometimes this mucus is tinged with blood. The pelvic broad ligaments are relaxed and uneasy movements of the animal with severe straining are often noticed. If the abortion occurs somewhat late in pregnancy a considerable quantity of a yellowish, brownish or sometimes greenish discharge is present. This is the so-called "abortion exudate," and at first it is odorless. It is usually flocculent, containing both fibrin and leucocytes. Heifers frequently and cows occasionally during the fifth or sixth month of pregnancy not uncommonly may show the udder and vulva changes noted above and not abort, the glandular activity subsiding after a few days.

It is exceedingly important to obtain an accurate history of the case. This should include the purchase of new animals both male and female, the number of animals failing to breed in the herd, the presence or absence of white scours, the age of the animals aborting, and the careful examination and history of the sire. One of the most important things to note is the presence or absence of retained placenta. Researches have shown that this condition is the result of infection and that it usually follows an abortion occurring after the fifth month. Retained placenta occurs, however, in many cases where a live calf has been delivered at full time, and here it is a significant sign that the infection of abortion is present in the herd.

The *essential point* to keep in mind in regard to the symptomatology is that abortions often occur without premonitory symptoms and a rich source of infection goes unnoticed.

LABORATORY AND CLINICAL TESTS

The laboratory and clinical tests which have been used to diagnose contagious abortion include (1) a bacteriological examination of the exudate or organs of the fetus, (2) the abortin test, (3) precipitation, (4) agglutination, and (5) the complement-fixation test.

Bacteriological Examination

The bacteriological examination to determine the presence or absence of abortion usually consists of smear preparations made from the cotyledons or exudates, cultures and guinea-pig inoculations. The *Bacterium abortus* Bang does not stain easily, and carbol fuchsin seems to be the preferable stain to employ, allowing it to act for some time or employing heat to hasten and intensify its action. Smith uses alkaline methylene blue to stain the spirillum isolated from cases of abortion by himself. Some authors state that the finding of a short rod in the smears made from the suspected material constitutes a presumptive diagnosis of abortion. We question whether one is able to make anything like a positive statement in regard to the presence or absence of abortion as a result of the examination of smear preparations. Moore and others have shown that the colon organism is often found in connection with abortions, and the variation of morphology between the colon and Bang organisms is not sufficient in all cases to enable one to distinguish positively between them. The chief value of smear preparations consists in determining the morphology of the organisms associated with the disease. Researches have shown that organisms of varying morphology (spirilli, streptococci, rods) may be associated with this disease, and smears are exceedingly valuable in giving a hint as to the varieties of micro-organisms which are present.

Cultures are valuable, but often are so badly contaminated with saprophytes that the causative organism is completely obscured. Cultures made from the fourth stomach of the recently aborted fetus seem to yield the best results when *Bact. abortus* Bang is the causative organism. Smith has gotten pure cultures of the spirillum found in cases of abortion from the fourth stomach, meconium and the lung tissues of the fetus. Stockman reports the isolation of a vibrio in pure culture from the fetal stomach in three outbreaks of

abortion among cattle. Wall has cultivated *Bacillus pyogenes*, *Streptococcus pyogenes* and other bacteria from the uterus of aborting cows. We have cultivated a streptococcus from the amniotic fluid of a fetus. Guinea pigs when inoculated with exudate or glandular material containing living *Bact. abortus* Bang develop the typical lesions of this disease in the spleen. The organism may also be isolated less constantly from the testicles, kidneys and bones.

The so-called guinea-pig test for the presence or absence of *Bact. abortus* is of value when the material is badly contaminated and cultures are useless. The natural protective forces of the guinea pig often destroy the contaminating organisms. On the other hand, if the material contains pyogenic or septic organisms, particularly anaerobes, the pigs will die within one to ten days before the abortion germ has started to produce lesions.

The value of these bacteriological examinations as methods for the routine diagnosis of abortion is not great. They do have an exceedingly great value in throwing light on the variety of organisms which may be associated with this disease. It should be kept clearly in mind, however, that *Bact. abortus* Bang has been isolated in by far the largest number cases and its presence or that of the other organisms mentioned constitutes a positive diagnosis of the disease. We do not believe, in the light of our present knowledge, that we can exclude the presence of infectious abortion when the cultures fail to grow. Smith reports 17.4 per cent of cultures "either sterile or else the digestive and respiratory tracts had been invaded during or after birth with miscellaneous bacteria. *Bacillus abortus* was absent according to cultures and animal tests." He further states that in bacteriological examinations of 109 cases of abortion the following results were obtained: Sixty-two or 57 per cent were associated with *Bacillus abortus*, 26 or 23.8 per cent were associated with spirilla, 2 or 1.8 per cent were associated with *Bacillus pyogenes*. Seddon fails to find *Bact. abortus* in 27 per cent of cows which gave a positive agglutination titre with 0.01 c. c. of serum.

The Abortin Test

The abortin test consists in the application to cattle of a material prepared from *Bact. abortus* analogous to tuberculin. It was first used by McFadyean and Stockman. A review of the literature does not indicate that this test has proved satisfactory for the diagnosis of abortion disease. Belfanti, Zwick and Zeller, Meyer and Hardenberg, Mohler and Traum, and Giltner obtained poor or unsatis-

factory results when using this test. We do not believe that the use of abortin can be recommended for the diagnosis of infectious abortion.

Precipitation

The precipitation test was first used by Szymanowski for the diagnosis of abortion. The results obtained were unsatisfactory. It was later studied by Pfeiller and Drescher and is reported by Pfeiller in his exhaustive report on the value of precipitation in the diagnosis of various diseases. In this report Pfeiller states that the precipitation test is not applicable for the diagnosis of abortion disease because many noninfected animals have considerable quantities of normal precipitin in their blood, and further, many infected animals have very small quantities of precipitin. This test is not satisfactory.

Agglutination

The agglutination test for the diagnosis of abortion was apparently first applied by Holth and Wall in Jensen's laboratory in Copenhagen. Since then it has been studied by many investigators both in the United States and in Europe. Several very important points have been demonstrated in regard to the value of the test in the diagnosis of this disease. Certain of these are well enough established to warrant accepting in the light of our present knowledge. Seddon in 1915 pointed out that more important than the dilution is the actual amount of serum used. In reporting results of the agglutination test one should not only give the dilution of the serum in the respective test tubes, but the actual amount of serum as well.

McFadyean and Stockman as a result of their work state that "One is justified in regarding complete agglutination with a serum dilution of 1-50 or 1-100 as strong evidence of infection." Surface considers an agglutination in dilutions of 1 to 100 or higher as practically certain evidence of infection. Brüll considers a reaction in a dilution of 1-64 as doubtful. Seddon considers that "an agglutination titre of 0.01 c.c. represents infection with *Bacillus abortus*." Cows giving an agglutination with any quantity of serum not exceeding 0.01 c.c. are therefore said to give a positive reaction, whereas those which require a greater amount of serum are considered to give a negative reaction. Rettger and White employed only two dilutions, 1-50 and 1-100. Smillie, Little and Florence consider "an agglutination titre up to and including 1:40 as negative as to the presence of *Bacillus abortus*." They state

further: "In any herd a uniformly low titre (1:40 or less) in all animals may be regarded as indicating the entire absence of *Bact. abortus*. A high titre in any one cow serves to indicate quite definitely the presence of infection in the herd."

The results of the investigators here reported as well as many others lead us to believe that a complete agglutination in a dilution of 1-50, or using approximately 0.02 serum, should be considered as highly suspicious; and a complete agglutination in a dilution of 1-100, or using 0.01 c. c. of serum, as positive evidence of past or present infection with *Bact. abortus* Bang.

The published data on the agglutination test indicate that at least four and preferably six different dilutions or amounts of serum should be used in the routine test of sera. Approximately these amounts and dilutions should be 0.05, 1-25; 0.025, 1-50; 0.01, 1-100; 0.005, 1-200; 0.002, 1-500; 0.001, 1-1,000.

Seddon has shown, and our own work has verified the statement, that occasionally agglutination will not show in the tubes containing the larger amounts of serum, but the reaction will be evidenced in those containing the smaller amounts. This is explained according to Zinsser on the basis of the presence of "pro-agglutinoid." We also believe that some of this inhibition can be avoided by employing only 1 c. c. of test fluid.

It has been shown by Rettger and White that young calves always have the same agglutination titre as their dams. Huddleson concludes as the result of his experiments that "there is no relation between the bacterial antibodies produced in the blood of the dam and that of the aborted fetuses taken from pregnant cows and newborn calves. In other words, agglutinins and complement-fixing bodies are not transmitted from mother to fetus in utero." This latter tends to confirm the work at the Experiment Station at University of Minnesota, which indicates that young calves may have the same reactions as their dams, but some calves are met with which do not. Further work done during the past years tends to bear out this statement.

It has been pretty clearly shown that heifers between the ages of 4 months and 1 year give negative results to the test. Occasionally an animal of this age is found which does react.

Herd bulls react, and in the recent publication of Buck and his associates *Bact. abortus* has been isolated from 4 bulls which gave positive reaction to the test. They conclude as a result of their work that infection of bulls is more strongly indicated by marked

rather than slight reactions to this test. Seddon reports the recovery of *Bact. abortus* from an artificially infected bull which gave an agglutination in a very high titre.

Smillie, Little and Florence studied bacteriologically a number of cases of abortion and also the agglutination reaction of the animals. In 19 animals a spirillum was isolated, and in 11 or approximately 58 per cent of this number the agglutination test was negative. In 42 per cent the agglutination test did not check with the bacteriological findings, but some of these cases can be explained on the basis of past infection. Eleven cases were found in which the fetuses were sterile or associated with a miscellaneous infection. Eight or 73 per cent gave negative reaction and 3 or 27 per cent gave positive reactions. These latter are explained because of previous infections. Forty-four animals had *Bact. abortus* isolated from the milk or fetus. Of this number 8 or 18 per cent gave negative results to the agglutination test. Seddon reports the agglutination test as agreeing with the bacteriological and clinical evidence of abortion disease in 82 per cent of the cases.

Based on the present results of the work on the agglutination test, we believe we are justified in stating that:

1. This test indicates the relative amount of herd infection; that is, a large number of positive reactions in a herd shows a widespread infection with *Bact. abortus*.

2. A positive reaction to the test indicates a past or present infection with the Bang organism. It does not mean that an animal ever has aborted or will ever abort. It may be an index of present immunity.

3. A negative reaction does not show positively that an animal has not aborted or will not abort in a short time.

Complement Fixation

The complement-fixation test was first reported by Holth and Wall in the diagnosis of this disease. Since then it has been reported by a large number of investigators both in this country and in Europe. The results obtained by this test do not seem to vary materially from those of the agglutination test. Giltner, Hallman and Cooledge carefully compared the results of the agglutination and complement-fixation tests on several different groups of animals. As a result of their work they state that "the margin of disagreement between the two tests is not so great as to utterly condemn either or both tests. It is evident that the complement-fixation

test will pick out more reactors than will the agglutination test, but on the other hand animals may react to the agglutination test and not to the complement-fixation test."

The presence of conglutine tends to modify the results of the fixation test, as does also the inactivation of the serum and the inhibition or anticomplementary action when used in low dilutions. These conditions were pointed out respectively by Fitch, Boyd and Billings, Thomsen and Surface.

The complexity of the technic of complement fixation as compared with agglutination is a factor which renders the latter the more valuable. Mohler and Traum state that in their experience "only in doubtful cases would it be necessary to refer to the more complex complement-fixation method." We believe that only in exceptional cases is it necessary to employ the complement-fixation test, that as a routine test it has no advantage over the agglutination method, and that it has certain specific disadvantages not possessed by this test.

POSTMORTEM FINDINGS

The gross postmortem findings in abortion disease are not usually pronounced. There is usually present subchorionic edema as a result of a gelatinous infiltration. The so-called typical abortion exudate may be present, widespread over the placental cotyledons. The cotyledons themselves may be a brownish red or a dirty yellow in color. Putrefaction of the fetus rarely occurs. The fetus may be perfectly fresh or in various stages of mummification. More or less edema of the fetus is not rare. The entire uterine contents contain the abortion germ. This is particularly true of the exudate and the chorion over the cotyledons. The contents of the fetal stomach contain the germ with the greatest certainty and purity. There may be present a marked subserous and subcutaneous infiltration with a bloody fluid. A reddish fluid is not rare in the body cavities. Some calves are born covered with the so-called abortion exudate.

CONCLUSIONS

Basing our opinion on the completed researches of the present time, we believe the following conclusions in regard to the diagnosis of abortion are justifiable:

1. Abortions due to other than specific biological agents are rare.
2. The history of physical examination of cases of abortion do not in all cases furnish definite grounds for a diagnosis. They are always, however, valuable adjuncts.

3. Abortion or the precipitation tests are of little if any value.
4. The cultural method is an exceedingly valuable aid in determining the cause of the particular case studied. Negative results from cultures can not exclude the presence of some infective agent.
5. The agglutination test is the most reliable of the serological methods of diagnosis. It will indicate the amount of herd infection. It will not pick out individual aborters. A positive reaction to this test means past or present infection.
6. Guinea-pig inoculation is a valuable method of determining the presence or absence of *Bact. abortus*. Many inoculated pigs, however, die of sepsis.

BIBLIOGRAPHY

An extensive bibliography is not deemed necessary, as excellent ones are available. Only the references relating to this subject not contained in these bibliographies, as well as the bibliographies themselves, are included.

Buck, J. M., Creech, G. T., and Ladson, H. H. Bacterium abortus infection of bulls. In Jour. Agr. Research, vol. 17 (1919), p. 239.

Contagious Abortion of Cattle. A Bibliography. In Vet. Rev., vol. 3 (1919), p. 137.

Giltner, W., Flowe, B. B., and Potter, G. M. Report on abortion disease of cattle. In Report 21st annual meeting, U. S. Live Stock San. Assn., Dec. 1917, p. 56, 73.

Pfeiller, W. Die Erkennung der bakteriellen Infektionskrankheiten mittels der Prazipitationsmethode. In Ztschr f. Infek. par. Krank. u. Hyg. d. Haus., Bd. 19 (1917), s. 70.

Seddon, H. R. Studies in Abortion Disease. In J. Compar. Path. and Ther., vol. 32 (1919), p. 1.

Smillie, E. W., Little, R. B., and Florence, L. An interpretation of the agglutination reaction to *Bacillus abortus* in 75 cases of bovine abortion bacteriologically controlled. In Jour. Expt. Med., vol. 30 (1919), p. 341.

Smith, T., and Taylor, M. S. Some morphological and biological characters of the spirilla (*Vibrio fetus* n. sp.) associated with disease of the fetal membranes in cattle. In Jour. Expt. Med., vol. 30 (1919), p. 299.

Smith, T. The bacteriology of bovine abortion with special reference to acquired immunity. In Jour. Exp. Med., vol. 30 (1919), p. 325.

Smith, T. The etiological relation of spirilla (*Vibrio fetus*) to bovine abortion. In Jour. Expt. Med., vol. 30 (1919), p. 313.

Dr. S. L. Bond, inspector in charge of the Bureau of Animal Industry at Louisville, Ky., has resigned to take effect January 15.

THE UNITED STATES ARMY VETERINARY CORPS SERVICE OF THE INTERIOR¹

By C. J. MARSHALL

Former Assistant Director of the Corps

PROBLEMS OF ORGANIZATION

THE entry of our United States into the great World War created an emergency to which persons in all vocations responded and patriotically placed their services at the disposal of our Government in the lines to which they would be best adapted. In common with others, the veterinary profession throughout the whole country offered its services to build up a sufficient and efficient corps to handle the animal-transport and food-inspection branches of army activities. At no period was there a dearth of veterinary assistance. The volunteers were in such numbers that it was difficult to place them promptly in active service, as it was necessary first to establish a proper foundation upon which to build the organization.

An act of Congress, in effect less than a year, had transferred a totally inadequate and loosely organized veterinary branch to the Medical Department of the Army. The extra tasks and responsibilities devolving upon the Surgeon General in command of the Army Medical Department, as the possibilities of war became probabilities, had rendered it impossible for that officer to organize a proper army veterinary service or to acquaint himself with its needs and the capabilities of the few officers then available in that branch. When we were verging upon war a senior veterinary officer and one assistant were called to the Surgeon General's Office at Washington. Their services were given almost entirely to the examining of veterinarians as prospective officers for an enlarged veterinary service. Several hundred young men, fresh from college, with no practical veterinary or military training, were selected and immediately assigned to duties with horse-purchasing boards, remount depots and other important branches wherein they encountered problems of vital importance.

Not only were these young officers unsuited for this work by lack of training, but they were further handicapped by the absence of supplies, equipment, plans and regulations which should have been made available in advance for the proper conduct of their

¹ Address before the fifty-sixth annual meeting, American Veterinary Medical Association, New Orleans, November, 1919.

work. Many of them were hastily commissioned as second lieutenants and sent overseas before they had opportunity to gain even a rudimentary knowledge of army duties.

Horses and mules were daily bought in large numbers and shipped to remount depots that were only in process of construction and unequipped with proper facilities and supplies to care for the great number of hospital cases resultant from exposure to diseases while in transit. The unorganized veterinary service had no enlisted personnel and but few men qualified to supervise the important work thus thrust upon the remount depots. Sickness and deaths among the animals increased to an appalling extent, but no authoritative reports of true conditions were obtainable.

The seriousness of the emergency thus created impelled the Surgeon General to call a number of well-known veterinarians from authoritative positions in civil life to assist in creating a properly organized army veterinary service. Most of the men selected were as inexperienced in military matters as were the younger men who had preceded them into the service, but they had the great advantage of wide practical experience in handling the diseases that were causing so much havoc among public animals. They immediately realized the value of such assistance as would be rendered by veterinary officers experienced in military affairs, and suggested that three of the best-known veterinary officers in the Regular Army be ordered to Washington. The orders, though promptly issued, could not be executed until nearly three months had elapsed, as the services of these officers were almost indispensable in the field and it was difficult to effect their transfer to office duties. Pending their arrival, the office staff as it then existed was virtually without an authoritative head, even though the staff had been in existence for some time. The outlook was extremely discouraging to those at headquarters, as there was an apparent lack of harmony between the senior veterinary officer and the veterinarians from civil life who were endeavoring to save valuable time in placing the veterinary service on an efficient basis. The advisory veterinarians had no army commissions, consequently had less authority than the "one dollar per year men" who were so much in evidence during the later periods of war activities. They continued thus, merely in an advisory capacity, until October 3, 1917, on which date several of them were given the military rank of major. The commissions had not been sought by those who received them, and the conferring of the commissions was regarded with disapproval by some of

the men older in the service, who looked upon the action as an unmilitary way of handling the situation.

With matters thus arranged, progress might have been more rapid if the veterinarians of military experience could have been spared from their commands and permitted to respond more promptly to the order of the Surgeon General.

As the newly created officers became more familiar with military customs and better acquainted with the veterinary officers of the Regular Army, it was found that most of the previous troubles had been due to a perverted imagination or a misunderstanding between the persons concerned. The gap between the civilian and the army viewpoint was gradually bridged and proved not so great with the mutual understanding that all were working for a common cause—an efficient veterinary service.

One of the most important measures undertaken was the preparation of what later became known as "Special Regulations No. 70." Fortunately there was available a copy of the organization of the British Army Veterinary Service, which was conceded by all to be best adaptable to our conditions. Our plan was patterned after the British service as nearly as our army organization and customs would permit. The Secretary of War advised that the proposed plan could be handled under the Overman Act of May 18, 1917, and that additional legislation would not be required.

The task of preparing the regulations was less difficult than that of having them adopted and put into a working order, as much of the material was new to our army officers in general. Those in charge seemed not to have the confidence to give requested authority and responsibility to veterinary officers, apparently basing their opinions on the class of veterinarians who had been taken into the service during the rush at the beginning. They would not believe it possible for veterinarians to possess the necessary administrative abilities. Many personal interviews and conferences and much correspondence were required to persuade them that the work could be successfully handled in accordance with the proposed plan.

Special Regulation No. 70 was finally authorized by the Secretary of War, December 15, 1917. It defined the administrative zones; objects of the veterinary corps; organization of the corps in war; titles of veterinary officers in general; veterinary service of the interior; veterinary service of the theater of operations; supplies and materials.

In the interval between the drafting of the regulations and their

adoption Lieutenant-Colonel R. B. Miller of the Medical Corps was assigned as acting director of the Army Veterinary Corps. This assignment met with the universal approval of those at veterinary headquarters. Lieutenant-Colonel Miller had been in the Army Medical Service for many years and was thoroughly familiar with the customs of the service, the Army Regulations, the Manual of the Medical Department, etc. He proved himself to be of inestimable value to our corps. He was a full master of the situation, absolutely fair and dependable in every way during the short time he was with us, and a most valuable consultant after his assignment to another position in the Medical Service proper. It was through his efforts principally that General Orders No. 130 was obtained on September 25, 1917, which provided commissioned veterinary officers and an enlisted personnel on a percentage basis. He was instrumental also in completing the material for Special Regulations No. 70 and its final adoption. He instituted the weekly telegraphic sick and death reports, which later proved so valuable. The first reports were received December 8, 1917. Up to this time no reports had ever been made of sickness or death among our public animals. He divided the service of the interior into five zones and selected a veterinary officer as general inspector of each zone. This work was started in the early part of December. The importance of such inspections had been demonstrated as early as September 5, when two of the veterinarians on temporary duty had reported the results of their inspections of the remount depots at Front Royal, Va., Fort Reno, Okla., Fort Sam Houston, Texas, and Fort Bliss, Texas, in accordance with Special Orders No. 175, paragraph 105, and Special Orders No. 185, paragraph 26.

In addition to Colonel Miller's assignment as acting director of the Corps, another fortunate circumstance occurred on November 12, 1917. This was the arrival of Lieutenant-Colonel Aitken of the British Veterinary Corps, by orders from His Majesty's Service in response to a request from the Surgeon General. Lieutenant-Colonel Aitken had served in the British Army Veterinary Service for about twenty years. He had seen service in France from the beginning of the war and was thoroughly familiar with the needs for a properly organized service. He worked unceasingly during his six months' assignment in Washington to help place our organization on a foundation of efficiency. He was always just and fearless. His arguments and reasons were usually convincing. He was exasperated at times by the delay in matters which he realized so

well were imperative for the efficiency of our Army. He remarked on one occasion that "every hour we lost in getting ready for action, thousands of good fellows were losing their lives."

When it became necessary to transfer Colonel Miller, Lieutenant-Colonel C. F. Morse of the Medical Corps was assigned to his place in our office. He was eventually appointed director and promoted to the rank of colonel, and has given undivided attention to this work from the time Colonel Miller left to the present time. He has proved a thoroughly efficient officer and is highly respected by all at veterinary headquarters. All that has been said of Colonel Miller's splendid qualifications are equally applicable to Colonel Morse. The only regret ever expressed by our men was that he was not a veterinarian. The fact that he had received no veterinary training militated very little against his success as a director. Our principal troubles were very similar to those in human medicine, with which he was familiar. The more we knew him the more we realized the wisdom of his selection as director. It was not until after his incumbency as director that the headquarters office was able to do much that was of real value and assistance to our men in the field. A large portion of the time before this had been spent in preparation.

Colonel Morse revised Special Regulation No. 70 and made it more valuable and workable in the field. He organized the office force and placed it on a more workable basis. He instituted and systematized reports from the various branches of the service which should prove of inestimable value, and issued many circulars of instructions for standardizing the work in the field in the future. The Veterinary Corps is under great obligations to the Surgeon General of the Army for the able assistance furnished by Colonel Miller and Colonel Morse. The relations between the Surgeon General, the director of the corps and the veterinary officers were most cordial at all times.

It was planned from the first that the entire veterinary service should be placed under the administration of the veterinary officers acting under the orders of the Surgeon General. This was never fully accomplished. For example, our service in remount and embarkation depots was always subservient to the commanding officer of the depot. The veterinary hospital in each of them was constructed and equipped without consulting the Surgeon General's Department, yet the work in them was to be done under his direction. We believed, and are still of the same opinion, that the

remount, embarkation and debarkation depots are not proper places for veterinary hospitals. So far as our service is concerned these depots should be treated the same as a brigade of infantry, a regiment of cavalry, a brigade of field artillery, a regiment of engineers and other mobile organizations. Unfit animals should be collected from them and sent promptly to a hospital well isolated from animals that are in working condition. Plans were completed for such disposal of unfit animals from all organizations except the remount and embarkation depots in the department of the interior. For some unknown reason those in charge preferred to collect the sick, lame and injured animals from all organizations in a camp together in a remount depot and treat them there. This fact militated greatly against giving veterinary officers and enlisted men the training they so much needed in hospital service for overseas duty, and at the same time was a dangerous source for spreading transmissible diseases. Six veterinary officers and 72 enlisted men were assigned to each remount and embarkation depot of 5,000 capacity. Such men had decidedly poor prospects for overseas service, which the majority would have much preferred.

With the exception above stated, for which the Surgeon General's Office was not responsible, the work was organized and conducted at home practically as originally planned. Additional authority obtained from time to time, added to that provided by Special Regulation No. 70, made it possible to organize, train and equip the Veterinary Corps in a decidedly satisfactory and efficient manner.

After January 1, 1918, each division of troops that went abroad was provided with a complete veterinary personnel of 12 officers and 51 enlisted men, organized, equipped and supplied before sailing. The division veterinarian was attached to the staff of the commanding general. He had as assistant a veterinary officer who had been trained in meat and milk inspection. All meat and dairy products used by the troops were carefully inspected before issue. Each division had a trained mobile veterinary section, consisting of 1 veterinary officer and 20 enlisted men, equipped and mounted. The duties of these men were to collect sick, lame, emaciated and wounded animals from divisional organizations and remove them to hospitals or other suitable places for treatment.

Veterinary service was also supplied to all regiments of cavalry, artillery and mounted troops scattered about the country and to all military posts which had a sufficient number of animals to justify the assignment.

VETERINARY TRAINING CAMP SCHOOLS

In addition to the service attached to each division, the Surgeon General's Office was required to organize, train and equip 204 veterinary officers and 8,400 men for veterinary hospitals and mobile units to serve overseas with army corps, armies, at the base and on the lines of communication. Training facilities were afforded for these men at Camp Lee, Va., the veterinary section of the Medical Officers' Training Camp, Camp Greenleaf, Ga., and at Fort Riley, Kans. The school at Camp Lee had a capacity for about 1,800 officers and men. Green men were sent to this school to be trained, equipped, instructed and organized into units for overseas duty. The school had a faculty of line officers for giving military instruction and veterinary officers to teach professional subjects. The commanding officer was Colonel Sturges, a line officer. Lieutenant-Colonel Gerald E. Griffin, the second senior veterinarian of the corps, was his assistant.

The school at Camp Greenleaf was equipped to give instruction to veterinary officers. A class of 75 men was graduated from this place June 20, 1918, and preparations were made to graduate about 100 men each month thereafter. Most of the students were fresh from civil life. The capacity of the school was about 250. It was planned to send veterinary officers from the various organizations to this school for training as fast as their services could be spared and there was room for them at the school. Major Stokes, a Regular Army veterinarian, was the senior veterinary instructor. There were nearly 600 enlisted veterinarians, most of whom were subject to draft and fresh from college, at the school at the time the armistice was signed.

The veterinary section of the Medical Officers' Training Camp at Fort Oglethorpe was the principal veterinary training school maintained during the war. The original purpose was to train commissioned veterinary officers in their military duties and to fit them in the shortest possible time for military service. The time was too short and the demand too urgent to attempt to teach subjects pertaining to veterinary medicine, and the officers as graduates were all supposed to be qualified professionally. Had the war lasted, it was contemplated to expand the curriculum along these lines. The reserve officers were ordered to this school in lots of 100 and were put through a two months' course of instruction intended to be strenuous and intensive, although not more so than that required of the dentists and doctors. It was contemplated to eliminate dead

wood and classify the men as to the nature of the duty for which they were best fitted. At the end of the course they were assigned to divisions, sent to the training school at Camp Lee for duty with veterinary hospital units proceeding overseas, or sent to stations in the United States.

In addition to the officers in training, it was found desirable to maintain a company of enlisted men of the Veterinary Corps for training and for general duty. A considerable number of enlisted men were trained in this company and sent to different stations where as assistants to the veterinary officers they rendered good service.

In the spring of 1918 there arose the question as to the future of the 1918 graduates in veterinary medicine. The men who were within the draft age had been allowed by the Government to enlist in the Medical Enlisted Reserve Corps for the purpose of completing their veterinary education. The Government could have taken them as soldiers at any time, but considered that as individuals they would be of greater value if they were permitted to graduate. In other words, their call into active service as enlisted men was simply delayed to suit the convenience of the Government and for no other reason, nor under the law had they any rights or claims by reason of this delay, and the Government in effect stood ready and had full authority to assign them to immediate duty *as enlisted men* whenever it was deemed expedient. The foregoing facts should be distinctly understood. In certain quarters it has been asserted that a degree of immunity or exemption from service was assured as a special reward for enlistment in the Medical Enlisted Reserve Corps, but nothing could be further from the truth. The Surgeon General's Office looked on these men as a reservoir of future commissioned veterinary officers of great potential value, and needed the services of every man who could qualify.

At the same time there was almost daily evidence of the inefficiency of the veterinary service on the part of the veterinary officer fresh from civil life by reason of his pathetic ignorance of the military machine and his relations thereto. Accordingly a plan was devised for sending the 1918 graduates, as a body, to Camp Greenleaf for three months' training as enlisted men, with the strong conviction that in no other way could they learn the military game from the ground up. This plan likewise presented an opportunity to observe the men and determine their qualifications to an exceptional degree. It was further planned to examine them for com-

missions at the end of the training period; to grade the entire class on the results of their examinations, and to give the successful candidates a course of instruction in the officers' section before sending them to service with troops.

The plan outlined was entirely sound and should have resulted in a large number of newly commissioned officers becoming available by November 15, assuming they would arrive at Camp Greenleaf about July 15. The actual results were disappointing. About the end of June orders were requested for the assignment of the 1918 graduates, who, it should be remembered, were all enlisted men, subject to call. The orders passed from the War Department through the department commanders, and in consequence great and vexatious delay, incident to clerical shortage and difficulty in locating the men, ensued. They trickled into Camp Greenleaf instead of arriving *en masse* in the early days of July. They continued to come through August, September and October, and they numbered about 600.

It was soon apparent to the Surgeon General that a single course of three months' instruction was out of the question and that the delay in getting officers from this group would seriously inconvenience the Department. Consequently instructions were issued the commandant that the men should be examined for commissions as fast as they completed two months of training, which meant practically a policy of first come first served. The examining board proceeded promptly to work, and as rapidly as the papers were completed they were forwarded to the Surgeon General, who at once submitted recommendations to the Adjutant General for the issue of commissions.

About 170 such recommendations were in the hands of the Adjutant General on November 11 and the papers of more than 200 additional were in process of completion. The signing of the armistice at once terminated the possibility of giving a commission to anyone; in fact, the demobilization of the Army began at once.

The graduates of 1918 served their country as well as any other soldiers. The duties they performed at Camp Greenleaf were in every respect as dignified and important as were those of the men of equal age who did not happen to be veterinary students and who got to France as combatant soldiers. It was not the fault of the 1918 graduates that they failed to obtain commissions. It certainly was not the fault of the Surgeon General's Office, which was most anxious to secure their services as officers. Had the war lasted three

months more, every 1918 graduate who could qualify would have been commissioned and still the demand for officers would not have been satisfied. The fact must not be overlooked, however, that none of these men were entitled *per se* to commissions. They were essentially drafted men with the privileges of enlisted men and no more, and every man who could not qualify for a commission must continue in the service in an enlisted status. There is no question in the minds of those qualified to judge that the service of these veterinarians as enlisted men at Camp Greenleaf furnished the best possible basic training for service later as officers.

The veterinary section of the Medical Officers' Training Camp was in charge of Major W. J. Stokes of the Regular Corps, selected by the Surgeon General for his many excellent qualifications for this work. His assistants were veterinary officers selected and recommended by him. The work performed by Major Stokes and his assistants is believed to have been excellent. The vast amount to be done in a limited time and the shortage of trained assistants tremendously increased his task, and necessarily many details failed to receive the personal attention to which they were entitled and which under less strenuous conditions they would have received.

ORGANIZATION OF CAMP GREENLEAF TRAINING SCHOOL

The following paragraphs describe the organization of the veterinary training center at Camp Greenleaf:

1. ENLISTED SECTION.—The enlisted section of the veterinary training school at Camp Greenleaf, Ga., was organized May 2, 1918. Prior to this date the enlisted men of the Veterinary Corps were messed and quartered with the men enlisted for the Medical Corps. Large groups of new men were constantly arriving in camp, and men who had enlisted for service with the Veterinary Corps were being sent out with men enlisted for the Medical Corps for service in hospitals.

The situation was discussed with the battalion commanding officer, and authority was granted by the camp commanding officer and arrangements were made for the forming of a separate company of enlisted men of the Veterinary Corps.

The company officers were selected from a number of veterinary officers who had just completed their training and who were looked upon as being good material in view of their records as student officers. These officers, Lieutenants Maguire, Jones and Rundle, were assigned to duty with the development battalion with instruc-

tions to observe the men carefully and pick out those best suited for noncommissioned officers. Among those selected for noncommissioned officers there were several who had had previous service in various branches of the military service.

The duties of the officers assigned to the veterinary company were as follows: Lieutenant Maguire, later captain, company commander and directly responsible for the company administration; Lieutenant Jones, later captain, assistant in charge of the stables and instructor in mounted and dismounted drill; Lieutenant Rundle in charge of company mess and property.

Owing to these arrangements, the company was organized without delay and started off very smoothly when the company was called upon to go it alone. When this separation was effected the enlisted personnel consisted largely if not entirely of nongraduates who were to be trained as enlisted veterinary assistants. Later the graduates of 1918 were added to this company for instruction as enlisted veterinary assistants and later as prospective veterinary officers.

Soon after the organization of the veterinary company the stables of the Medical Officers' Training Camp, which were maintained for the purpose of giving riding instruction to the student officers of the M. O. T. C., were turned over to the care of the veterinary company. At the time of transfer there were 309 animals and 225 sets of horse equipment and wagons, all of which were in rather poor condition. This stable was administered by 5 officers of the Medical Department. Later the number of animals was increased to 360 and the equipment to 350 sets.

Among the animals were quite a number with vicious habits such as striking, kicking and biting. It was not at all unusual, prior to the change in administration, to see a student officer kicked out of a stall when approaching to saddle and bridle an animal. One of the first steps taken with a view to preventing injury of the men was to segregate these vicious animals and put a red ribbon in the mane, tail and forelock of those which bit, struck and kicked. Only good horsemen were permitted to handle these animals, which were later disposed of.

With but three officers to supervise such numerous and extensive activities, much of the responsibility rested, through necessity, with the noncommissioned officers. One of the greatest handicaps of the mounted service today is not only the lack of men who have a knowledge of the horse but the lack of men who have even an interest in him. While the acquisition of this stable meant that a

great deal of hard work would have to be done by the enlisted men of the Veterinary Corps, it was regarded as a great asset in that it would afford valuable experience in the care of army animals and equipment and ample opportunity would be afforded for riding instruction. The company was considered to be very fortunate in having among its noncommissioned officers several who had had previous experience in mounted organizations. These men were, in addition, excellent horsemen.

With this in mind, the opportunity to devote considerable time to this kind of work was welcomed, and approximately three hours a day were spent along these lines. The dismounted drill consisted of sanitary and infantry drill, manual of arms (this was discontinued owing to the necessity of turning in the rifles because of lack of storage room and the inability later to acquire them), tent pitching, gas drill, school of the soldier, etc.

Later, when instructions had been received to examine graduates for commissions as veterinary officers, special attention was given to instruction in army paperwork and rendition of reports. Mimeographed copies of letters and the most common and important reports were furnished each man. Books on army paperwork, Manual of Courts Martial, etc., were also furnished for instruction purposes.

Later it was believed that the company was sufficiently well organized and instructed to permit of the appointment of noncommissioned officers from among the enlisted graduates and thus permit the assignment elsewhere of the noncommissioned officers who had been on duty for some time. This step was taken, and these men were sent to Camp Lee, Va., where they joined overseas units and furnished valuable service.

The enlisted men of the company worked very hard. The condition of the stables, corrals and animals was greatly improved. A large new saddleroom and a small corral for animals on sick report were built. The good condition of the stables at all times and their remarkable freedom from flies were frequently commended by those in charge of the School of Sanitation.

The company planned and financed two dances which were for members of the company only and were well attended and apparently popular.

It is felt that many mistakes were made, and such were to be expected in such a large organization with so much to do and with so few officers—each one of whom had to be tried out thoroughly

for some time before making a final selection or rejection—to supervise the doing of it. The conditions were new to all and were frequently very complicated, and evolution was a rather slow process. It is believed that at the time the armistice was signed and the organization disbanded the requirements were quite well understood and all objectionable features were in process of correction or elimination.

2. COMMISSIONED SECTION, OR VETERINARY STUDENT OFFICERS' GROUP.—The student officers' group was formed in February, 1918, for the purpose of giving instruction as to the military duties of veterinary officers and reviewing those professional subjects which the army veterinarian would have to consider, such as sanitation and hygiene; and last but not least, getting into physical condition for field service the man who had spent too many hours each day at a desk or on the soft cushions of an automobile. It should be remembered that primarily the course was one of instruction in the military duties which are required of an officer. All these men were graduate veterinarians and there was neither time nor intent to teach the subjects pertaining to veterinary medicine.

At first the group was in command of a medical officer, and veterinarians were mixed indiscriminately with medical men, dentists, sanitarians and psychologists. Only one veterinary officer was assigned as instructor, and he was able to devote only such time for instruction purposes as was given him. Later, with a great increase in the demand for veterinary officers and the increase in the student group, other veterinary officers were assigned for duty with this group.

Later a veterinary battalion was formed and all the veterinary activities were under the supervision of Major Stokes. In addition to giving professional and military instruction to the student officers, much time had to be spent in conducting professional examinations, not only of the officers but of the graduates in the enlisted section who were ordered to be examined to determine their qualifications as prospective veterinary officers. In addition, veterinary services were required for the handling of an extensive glanders outbreak in Chickamauga Park.

The student officers' battalion was developed, and selected student officers were appointed as permanent company officers who, it was contemplated, would also give mounted instruction to their companies.

The acquisition of the stable company was considered a boon to

the veterinary officers, and two hours three times a week were devoted to riding. Owing to the inability to find suitable officers for instructors, it became necessary, if this important instruction was to be given, to utilize the services of the noncommissioned officers of the enlisted group. While not an ideal condition by any means, it was felt this instruction for officers about to go into active field service was absolutely essential. The value of a veterinary officer is not so much his ability to cure minor or major ailments but rather his ability to prevent them. A thorough knowledge of horsemanship is of great value along these lines. A veterinary officer who is able properly to saddle and ride an animal and give proper instruction in the subject is able to prevent the development of conditions which are responsible for the disability of many animals in the service. Likewise a veterinary officer who has had much experience in riding animals is a better judge of them fit for this purpose than one who has not had this experience.

It was, of course, realized that but little instruction could be given in the short space of time allotted, but it was hoped that the extreme importance of the subject might be impressed on the officers and their interest in it aroused. One of the greatest criticisms of the modern veterinarian called for army service is the lack of knowledge of horsemanship, due largely to the fact that the veterinarian of today makes most of his calls in an automobile and riding and driving are rapidly becoming lost arts.

It was greatly regretted that there was not an abundant supply of veterinary officers for riding instructors. Had the case been different these officers would have been detailed for duty as instructors with the veterinary company which was so short of officers.

HORSESHOEING, MEAT INSPECTION, ETC.

The school at Fort Riley had a capacity for about 350 students. Here men were given desirable courses in horseshoeing, cooking, baking, etc.

A veterinary officer was selected to give instruction in horseshoeing at each of the thirty-five remount depots. A Regular Army veterinary officer with expert knowledge of horseshoeing was detailed to visit the various camps and assist in organizing and equipping horseshoeing schools and give the necessary instruction in this important subject. The school at Fort Riley furnished many of the men who later became instructors in these schools. Major R. J. Foster was the senior veterinary officer at Fort Riley.

There were about 75 veterinary officers and an equal number of enlisted men under Major George A. Lytle on duty with the purchasing officer of the Quartermaster Corps, inspecting meats and meat products purchased for the Army at the various packing centers. In addition there were usually about 50 veterinary officers receiving instruction in army meat inspection. Ample facilities were given these officers to obtain experience and instruction in the work of selecting, inspecting, covering, storing, refrigerating, canning, smoking, curing, shipping, etc. As fast as these men became qualified they were assigned to organizations as meat and dairy inspectors, and new candidates were assigned for instruction. This soon became one of the most important branches of the service.

Much credit should be given the Federal Bureau of Animal Industry for the good work done on antemortem and postmortem inspections and the assistance rendered in meat inspection in general, until our service became organized and equipped to handle the work.

It is a credit to our country to note the enormous amount of meat handled by the Army with little or no complaint in so far as quality and wholesomeness were concerned. Inspections under Major Lytle aggregated from 10,000,000 to 16,000,000 pounds weekly for a long period. Thanks to this work, we had no "embalmed beef" scandal in this war.

LABORATORIES AND SUPPLIES

Veterinary laboratories were established in the early part of 1918 in Philadelphia and at each of the department laboratories of the United States. A veterinary officer with special training in the bacteriology and pathology of animal diseases was assigned to each of these laboratories. Their services proved exceedingly valuable in diagnosing obscure diseases and investigating many remedies recommended for preventing and curing diseases.

The supply division of the Surgeon General's Office labored incessantly with the selecting, standardizing, furnishing and shipping of all veterinary supplies used in the Army. It is true the supplies were inadequate and not obtainable at first. The meager amount of equipment and supplies transferred with the veterinary service by the Quartermaster's Department was practically worthless. The work had to be done from the bottom up by the supply department at a time when the capacity of the manufacturers and transportation companies was already taxed to the limit. It was not long, however, before an adequate supply of medicines, surgical instruments,

dressings and other supplies was available and continued to be provided abundantly till the end of the war.

SUCCESS UNDER DIFFICULTIES

The foregoing outlines the work required in planning and organizing the service. In conjunction with these manifold duties much was done in the way of directing the service in the field. This was no small task. More than 500,000 animals were hurriedly purchased in the first year and a half after war was declared. They were obtained in all parts of the country and a large proportion of them shipped in winter weather of the most extreme type over congested railroad lines for a thousand miles or more to the Atlantic seaboard. The sales stables, stockyards, cars and remount depots were heavily infected with influenza, glanders, lice, gangrenous dermatitis, pododermatitis and other diseases. Most of the remount and embarkation depots were located at points where conditions of climate and soil were decidedly unfavorable to health and comfort. Mud was often knee deep and no shelter or dry place was available for the many sick animals that arrived with the continuous stream of trainload consignments that congested these depots. This disgraceful situation developed as a result of conditions which existed before the veterinary service was organized or equipped, and had been permitted to continue on the plea of military necessity. Only a few veterinarians were stationed at these depots, and they had no available help except an occasional detail of "conscientious objectors" or of men from a labor battalion, detailed by the officer in command of the depot. Most of this class of help were inexperienced in handling horses and lacking in energy or ambition. Nearly every depot could have used to advantage the officers, men and equipment subsequently planned for a hospital of 1,000 animal capacity.

When one realizes the manner in which so many animals were purchased, shipped, stabled and sold during a period of two years, and the possibilities for them to spread disease to other animals in civil life, there appears to be just cause for rejoicing. Glanders was prevalent to some extent, but its spread was checked and the disease eradicated from army animals by the plans adopted by the Surgeon General. We have yet to learn of a case where glanders or other transmissible disease, even influenza, was carried from army animals to those in civil life. This service in controlling glanders was worth all the cost to the Government of the Veterinary

Corps, as without it the disease would have spread to an uncontrollable extent.

COMMISSIONS AND PROMOTIONS

Seventeen veterinarians were commissioned in the grades of captain and major on the recommendation of the Surgeon General for the purpose of securing administrative officers without delay. All the remaining commissions given out (about 2,050) were in the grade of second lieutenant. The promotions of officers in the United States were based on their records and on the recommendations of their superiors. The recommendations of general veterinary inspectors were relied on whenever these could be secured. In December, 1917, written examinations were held and several hundred veterinarians found qualified were promoted as rapidly as vacancies were open. Recommendations for promotion were passed on by a board of three senior veterinary officers on duty in the Surgeon General's Office and by the director of the Veterinary Corps before they were given final approval.

The foregoing applies strictly to the United States. Promotions in the American Expeditionary Forces were placed by the Secretary of War wholly in the hands of General Pershing, and after veterinary officers left the United States there was absolutely nothing to be done in this country to help or hinder their promotions. Their promotion over there depended on their efficiency in the service and the favorable recommendation of their superior officers. Vacancies in the overseas troops in proportion to their strength were of course not filled in this country but were considered as the quota belonging strictly to the Expeditionary Forces.

Time and space will not permit listing the veterinary officers who rendered meritorious services in the work to which they were assigned. Suffice it to say that nearly all veterinarians who were given commissions did their work in a creditable manner. Their work can be regarded with just pride.

VETERINARY SERVICE IN THE A. E. F.

As soon as the plan of organization was finally decided with the probability of its adoption by the War Department, two of our best and most trusted officers were directed to proceed to France and report to the Commanding General, American Expeditionary Forces, for temporary duty and consultation in regard to organizing, equipping and supplying the veterinary department of the Expeditionary Forces. They sailed on November 6, 1917, but due to unfortunate

misunderstandings did not arrive at General Headquarters in France until December 12, 1917. An outline of plans for organizing the veterinary service had been prepared before their departure and was presented to the Chief Surgeon of the Expeditionary Forces. He requested a memorandum on organizing a veterinary service for the Expeditionary Forces and a statement of the veterinary personnel which would be required at different phases of the priority shipment schedule on the basis of the proposed organization. This memorandum was prepared and presented December 27, 1917. The memorandum and statement were promptly submitted to the Chief of Staff and by him referred to the Administration Section. A cablegram having been received advising that Regulation No. 70 had been approved by the Secretary of War, a copy of the regulation was presented with the memorandum and statement. It was returned January 1, 1918, with the statement that the proposed plan of organizing was a very good one but would not fit in with the general plan of organization of the American Expeditionary Forces.

The matter was later taken up with Lieutenant-Colonel James A. Logan, Jr., Chief of the Administration Section, and other officers of the General Staff. After much discussion it was stated that it would be a waste of time to consider the question further, as it had been decided to attach the Veterinary Corps to the Remount Service and this decision was final.

The plan as adopted provided that an officer of the Veterinary Corps should be designated as Chief Veterinarian and assigned to act as assistant to the Chief of the Remount Service, to exercise technical supervision over the Veterinary Service and to draw up regulations and orders and a detailed professional description of all preventive and curative treatments of animal diseases and injuries. The latter was to be printed and distributed to the commanding officers of all branches of army service in which animals are used, for their instruction and guidance. Regulations and orders formulated by the Chief Veterinarian had to be submitted for approval to the Chief of the Remount Service. Many other provisions in this plan were equally unworkable, unreasonable and asinine. During these discussions it was pointed out that mange, glanders and epizootic lymphangitis had already appeared among the animals of the American Expeditionary Forces and that if suitable measures were not immediately instituted these diseases would spread rapidly—a prediction that later proved true.

Almost immediately after Special Regulation No. 70 was pre-

sented to the Chief of Staff an order was issued by Lieutenant-Colonel Logan in the name of the Commander-in-Chief suspending operation of the regulation in so far as it applied to the American Expeditionary Forces.

On February 22, 1918, the Chief Surgeon sent a communication to the Chief of Staff stating that from all that had been said, written and cabled during the previous months he gathered that so far as the veterinary service was concerned it was to be the duty of the Medical Department to furnish veterinary personnel and supplies for the American Expeditionary Forces and that the remainder of the veterinary service would be handled by the Remount Service. In reply it was stated that the order on the organization of the Remount Service, then in preparation, would make the Veterinary Service a part of the Remount Service under the Chief Quartermaster; the Chief Surgeon, after supplying needed veterinary personnel to the medical supply depots, was to report other veterinary personnel to headquarters for assignment by the Chief Quartermaster, and that supplies were to be furnished by the Medical Department. This meant that the administration of the Veterinary Service, except in reference to supplies, was to be taken away from the Surgeon General, although it was placed under his direction by the Act of June 3, 1916, and that the regulations approved by the Secretary of War were to be set aside.

There appeared to be nothing further for our representatives to do in the way of consultation in regard to the organization, equipment and supply of the Veterinary Service of the American Expeditionary Forces, consequently they left General Headquarters for return to their stations in Washington on March 10, 1918, with the proposed order for the organization of the Veterinary Service in course of preparation in Colonel Logan's office.

To say that we were disappointed with the results of this well-planned, properly executed effort to introduce our form of organization overseas would be putting the question mildly. It was soon decided to proceed with work as outlined in this country and await future developments. If the two services could have been correlated into one, the work here would have been much easier and more readily and effectively utilized overseas.

It was not long before a request was received from overseas for another veterinary officer from the headquarters office. Our hope of placing the plan of organization on a working basis was again aroused. The one sent this time was among the first who was called

by the Surgeon General in the early part of the war. He responded to the second call as promptly as he had to the first. The results of his efforts overseas can best be judged by a paper which will follow.

THE FUTURE UNCERTAIN

It is the general belief that the plan promulgated in America for handling the veterinary service in war was satisfactory, efficient and workable. The Surgeon General's Office has no excuses to make for it. Nothing better was suggested or available under the conditions. There were many ways in which it could have been improved. Most of these possibilities were blocked by the want of suitable legislation or permission from higher authority.

It should be understood that the plans and organization under which the Veterinary Corps operated were possible only as a war measure and authority for the existence of the corps will be terminated by the provisions of the Overman Act as soon as the emergency for which it was created is over. The future destiny of the corps will depend greatly upon legislation now pending. There is no authority or assurance that the veterinary directorate will be continued and the army veterinary service may drop back into the old condition of affairs that existed before the war, unless prompt measures are provided to prevent it. The Surgeon General stands ready to do all in his power to make it attractive for veterinarians and a useful factor in the Army. The time appears ripe for united intelligent action. The need for veterinary service in the Army has been demonstrated beyond a doubt. The recent experience has imbued those who participated with the wonderful possibilities for good there is in an army veterinary service authorized, organized, equipped and ready to be sufficiently expanded on short notice to meet any emergency that may arise. Each of the more than 2,000 veterinarians who saw service in this war, every member of this Association, and all who are interested in the welfare of animals and animal husbandry in general, should do his utmost to place this important branch of our profession on an efficient and substantial basis.

Our Association can assist by a persistent, continued effort for a higher standard of efficiency among veterinary schools and veterinarians in general. If this service is to continue as a part of the Medical Department, veterinarians must be equally as well qualified mentally, physically, morally and intellectually as men in the Medical or Dental Corps. There is great need for enthusiastic interest

in the Army Veterinary Corps on the part of civilians. We should give it our most loyal support on every occasion, make a determined effort to interest promising young men to enter the service and support the Corps to the fullest extent of our ability in its various troubles. We should be "boosters" and not "kickers" and should waste no time in quibbling over the mistakes and imperfections of the past.

A recent visit to Rock Creek Cemetery, Washington, D. C., during the Yuletide season showed that some interested friend was keeping memories green by placing floral tributes on the near-by graves of Drs. D. E. Salmon, A. D. Melvin and Charles M. Mansfield, the latter a young veterinarian of sterling quality and great promise when stricken at the very beginning of his career in the Biochemic Division of the Bureau of Animal Industry.

Captain R. Daubney of the British Board of Agriculture and Fisheries, following active service in the British Army since August, 1914, has been detailed to the United States for a period of about a year, to make a study of the subject of parasitology and will carry on the major portion of his investigations in the laboratories of the Zoological Division, Bureau of Animal Industry, Washington, D. C.

Dr. O. A. Longley of California has just returned from an extensive and successful tour of Australia and New Zealand in the interest of the Lederle Antitoxin Laboratories. From his reports he must have had a very interesting and enjoyable trip meeting most of the prominent veterinarians and live stock sanitarians of those countries.

Drs. Humphries and Robbins of the Southern Railway service were recent visitors to Washington in connection with the heavy losses among mules shipped over their lines.

Dr. M. H. Dollar, formerly engaged in Hog Cholera Control work for the B. A. I., has resigned and is now practicing at Danville, Ky., with Dr. Chas. W. Fisher.

BACTERIOLOGIC STUDIES OF A PERACUTE DISEASE OF HORSES AND MULES

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(Continued from the January number)

ANIMAL TRANSMISSION EXPERIMENTS

THE pathogenic character of the organism was determined by feeding the cultures to horses and mules, and to small animals, as well as by intravenous, intraperitoneal and subcutaneous inoculations.

LARGE ANIMAL EXPERIMENTS

MULE TRANSMISSION EXPERIMENT NO. 1.—Two mules were fasted for 52 hours to induce fatigue simulating the condition of lowered vitality incident to journey by rail. The animals were then allowed food and water ad libitum as a practice employed in transit at railway unloading and feeding stations. In the feed of Mule B 100 c.c. of a broth culture of Gartner's bacillus were disguised. Mule A was allowed similar portions of food, uncontaminated. Both animals ate heartily after the fasting period. The following day Mule B was clinically afflicted. The symptoms displayed were regarded by experienced observers as typical of the natural disease, i. e., extreme depression, cardiac weakness, loss of appetite, cyanosis of the mucous membranes, etc. Forty-two hours later death occurred. Gross anatomical alterations observed were not marked nor of a character sufficient to explain death, which was characteristic of the peracute disease occurring naturally. From the spleen of Mule B the organism fed was regained without difficulty. Mule A remained healthy. (See Table 4.)

MULE TRANSMISSION EXPERIMENT NO. 2.—Three healthy mules, designated C, D and E, were fasted 36 hours, at the end of which time water and feed were allowed ad libitum. In the feed of Mule C 50 c.c. of a 48-hour broth culture of Gartner's bacillus recovered from Mule B of the preceding experiment was employed. A like amount of a similar culture heated at 80° F. for 20 minutes was fed to Mule D, and 50 c.c. of sterile filtrate of a 48-hour broth culture was placed on the feed of Mule E. The latter two preparations were tested for sterility. During the administration of this

TABLE 4—MULE TRANSMISSION EXPERIMENT NO. 1.

ANIMAL	DECEMBER 20, 1918	DECEMBER 21, 1918	DECEMBER 22, 1918	DECEMBER 23, 1918
Mule A	<p>Temperature: 8:00 a. m., 97.8 4:00 p. m., 99.0</p>	<p>Rice meal and hay ad libitum at 2:00 P. M.</p> <p>Temperature: 8:00 a. m., 97.4 4:00 p. m.</p>	<p>Normal</p> <p>Temperature: 8:00 a. m., 101.1 4:00 p. m., 101.6</p>	<p>Normal Released from test Dec. 30.</p> <p>Temperature: 8:00 a. m., 100.4 4:00 p. m.</p>
Mule B	<p>Temperature: 8:00 a. m., 97.8 4:00 p. m., 97.8</p>	<p>2:00 p. m., 100 c.c. broth culture Gartner's bacillus on feed.</p> <p>Temperature: 8:00 a. m., 98.4 4:00 p. m., 99.0</p>	<p>Dejected appearance; no appetite; rapid breathing; congestion m. m. of mouth; restive attitude; stands drooping, sleepy appearance.</p> <p>Temperature: 8:00 a. m., 103.4 4:00 p. m., 103.0</p>	<p>Died at 8:00 a. m. Autopsy; lining small intestines mildly congested; fracture of rib incurred through violence during illness. Organism recovered from spleen.</p>

material in feed, Mule E, which consumed the filtrate, was permitted through error to ingest a portion of the feed containing the virulent culture prepared for Mule C. Three days later Mule E succumbed. It was noted the preceding day that this animal was very sluggish and depressed, yet the rapid termination was not anticipated. The autopsy on this animal was delayed until postmortem changes masked any gross lesions that might have accompanied death. The organism fed was regained from the stomach, cecum and kidneys. Mule C survived approximately 48 hours longer, but typical symptoms of the sporadic disease were noticeable for two days preceding death. Diarrhea was very marked and upon postmortem the cecum and colon were found to be involved, as described under gross pathology of the disease. Mule D showed no visible symptoms of illness following the ingestion of the killed culture. (See Table 5.)

MULE TRANSMISSION EXPERIMENT No. 3.—The pathogenicity of Gartner's bacillus by intravenous and subcutaneous modes of infection was tested on two healthy, unfatigued mules, designated F and G. The former received 2 c.c. of a 24-hour surface growth upon agar, suspended in saline solution. A thermal reaction followed, accompanied by transitory symptoms of depression. The animal was inactive for several days but recovered completely. Following the subcutaneous injection of 3 c.c. of a similar suspension into Mule G a slight rise in temperature (102.8) was noted on the succeeding day. The appetite continued normal, but at the point of inoculation a large, indurated, sensitive swelling developed, 18 by 3 cm., which persisted for several days and was noticeable at the end of three weeks. Complete absorption was preceded by a small area of pus formation at the point of inoculation, though the animal continued apparently healthy.

As a result of intravenous and subcutaneous inoculations it is thought that Gartner's bacillus does not multiply in the blood stream to result in general invasion of a healthy horse. It is presumed that the natural mode of infection is probably of intestinal origin and that the growth and multiplication probably occurs under certain conditions in the intestinal tract with the elaboration of poisonous substances which gain entrance to the circulation. A primary intoxication rather than a bacteriemic invasion is thus suggested. This contention is further suggested from culturing the blood of naturally and artificially infected animals during the course of the disease. In many instances 5 to 10 c.c. of blood was drawn aseptically from naturally afflicted animals into 50 c.c. of dextrose broth, which

TABLE 5.—MULE TRANSMISSION EXPERIMENT No. 2
Animals fasted for 36 hours before feeding.

ANIMAL	JANUARY 2, 1919	JANUARY 3, 1919	JANUARY 4, 1919	JANUARY 5, 1919	JANUARY 6, 1919	JANUARY 7, 1919	JANUARY 8, 1919
Mule C	2:00 p. m., 50 c.c. broth culture, 48 hours, Gärtner's bacillus.	Apparently normal.	Loss of appetite; dull.	Loss of appetite; dull.	Loss of appetite; dull; diarrhea.	Loss of appetite; dull; diarrhea.	Died at 7:00 a. m.
	Temperature: 8:00 a. m., 102.4 4:00 p. m., 102.5	Temperature: 8:00 a. m., 102.4 4:00 p. m., 102.5	Temperature: 8:00 a. m., 100. 4:00 p. m., 100.	Temperature: 8:00 a. m., 101.4 4:00 p. m., 101.4	Temperature: 8:00 a. m., 98.4 4:00 p. m., 99.0	Temperature: 8:00 a. m., 101.0 4:00 p. m., 101.1	
Mule D	2:00 p. m., 50 c.c. broth culture, 48 hrs. Gärtner's bacillus heated 20 min. at 80 C.	Normal.	Normal.	Normal.	Normal.	Normal.	Normal.
	Temperature: 8:00 a. m., 98.7	Temperature: 8:00 a. m., 98. 4:00 p. m., 99.	Temperature: 8:00 a. m., 100. 4:00 p. m., 100.	Temperature: 8:00 a. m., 100. 4:00 p. m., 99.	Temperature: 8:00 a. m., 98.6 4:00 p. m., 100.	Temperature: 8:00 a. m., 99.5 4:00 p. m., 99.	Temperature: 8:00 a. m., 100.4 4:00 p. m., 100.
Mule E	2:00 p. m., 50 c.c. broth culture, 48 hours, filtered through Berkefeld filter.	Apparently normal.	Loss of appetite.	Loss of appetite and diarrhea.	Died.		
	Temperature: 8:00 a. m., 100.6	Temperature: 8:00 a. m., 99. 4:00 p. m., 99.	Temperature: 8:00 a. m., 100. 4:00 p. m., 100.	Temperature: 8:00 a. m., 100. 4:00 p. m., 101.6			

The value of this experiment in establishing the toxicity of the filtrate is disregarded, as Mule E consumed a portion of Mule C's feed.

remained sterile after incubating for a period of 10 days at 37.5° C.

MULE TRANSMISSION EXPERIMENT No. 4.—It would appear from the following that intravenous injection and oral administration of Gartner's bacillus do not produce fatal results in healthy *unfatigued* animals. This conclusion is based upon the result of an experiment wherein a healthy mule designated H received c.c. of a 24-hour agar surface growth of strain 104-B suspended in sterile salt solution. There was a slight thermal reaction (102.1° F.) on the afternoon of the third day. Following the intravenous injection an allergic-like reaction occurred. Respirations were increased, defecation was labored and intermittent, with a staggering gait and general fatigue. The following day the symptoms were not so marked, and on the third day food and water were consumed. The animal returned to normal and continued apparently healthy. Release followed 10 days later.

Mule I received 100 c.c. of a broth culture of the same strain per os as a drench. The following day the animal appeared dull and depressed with loss of appetite. There was no increase in temperature. On the third day a "tucked up" or gaunted appearance was noted. On the fourth day the animal showed slight improvement and partook of a small quantity of food, followed by improvement each day until released from the test 10 days later.

It is apparent that the organism as administered to the animals H and I had only a transitory effect following intravenous injection, contributing to the contention that it induces a toxemia rather than a bacteriemia. In the case of Mule I 100 c.c. of the organism as a drench did not produce the clinical disease under observation, suggesting that a susceptible host must be subjected to conditions similar to those occurring incident to shipping; that is, fatigue, fasting, etc., in order to create the conditions under which invasion of the animal naturally occurs.

TRANSMISSION EXPERIMENT No. 5.—At the time this experiment was undertaken little was known as to the real identity of the organism under investigation, but it was desired to ascertain, if possible, the following facts:

1. Whether a bouillon filtrate of the original strain 104-B which proved virulent for mules (and which had been growing for three months) would produce death, as well as to determine whether or not vaccination, as in the case of Mule H which had received 4 c.c. of an agar culture intravenously and had been fed 100 c.c. of a bouillon culture of strain 104-B, and Mule I which was inoculated

per os on two occasions with 100 c.c. of the same strain, would produce an active immunity of sufficient strength to protect these animals against 100 c.c. of a broth culture of 104-B administered per os.

2. Whether 100 c.c. of antiserum (?) obtained from Mule G, which had been inoculated several times subcutaneously with this same organism, and which demonstrated the presence of complement-fixing and agglutinating bodies, would likewise prove of value as a protective agent.

3. Whether a broth culture of strain 141, recovered from the axillary vein of a spontaneous case and which appeared serologically to be the same organism, would produce death.

4. Whether *Bacillus coli communis*, usually encountered in the intestinal contents of horses, had any bearing on the malady.

5. Whether 100 c.c. of a broth culture of 104-B, heated at 60° C. for one-half hour, would demonstrate toxicity.

6. Whether two organisms, strain H-31 (or QMC) obtained from feces in the Quartermaster's Stables at Fort McPherson and passed through a guinea pig, and strain Mule 11, obtained from a rectal culture of a spontaneous case, both resembling the organism being investigated, would also prove virulent.

Mule R served as a control and received 100 c.c. of strain 104-B.

Details of this experiment are given in Table 6.

As will be seen from Table 6, all animals remained alive except Horse P, which received 100 c.c. of a broth culture of strain H-31 (QMC), which had been isolated from the Quartermaster's Stables. This animal showed well-marked symptoms of the disease 24 hours after inoculation, including cyanosis of the mucous membranes, profuse ill-smelling diarrhea, imperceptible pulse, general weakness and inappetence, elevated temperature (103-105), and death at about the forty-eighth hour. Postmortem examination revealed little, due, undoubtedly, to the acute character of the disease. However, there was a slight hyperemia of the mucous membrane of the fundus portion of the stomach, which may or may not have been significant, and a few punctiform hemorrhages beneath the capsule of the spleen. The organism was recovered from the spleen.

From a general survey of the results it would appear that culture 104-B, which had been growing since November 30, 1918, and was, at the time of feeding, nearly 3 months old, had lost in virulence to such a degree that it was unable to produce the disease, for the control animal R, which had received nothing of a protective nature,

TABLE 6.—FEEDING EXPERIMENT No. 5.
A.1 animals fasted 48 hours before feeding. Inoculated 11:00 a. m., February 21, 1919.

ANIMAL	MATERIAL		AGE	AMOUNT	METHOD	RESULTS
	CULTURE					
Mule H	Broth culture Gärtner's bacillus 104-B	Nov. 30, 1918	c.c.	Fed	Apparently normal after 11 days.	
Mule I	Broth culture Gärtner's bacillus 104-B	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.	
Mule K	Serum from Mule I	Nov. 30, 1918	100	Intravenous	Apparently normal after 11 days.	
Mule L	Broth culture Gärtner 104-B		100	Fed		
Mule M	Broth culture (axillary vein 141)	Feb. 14, 1919	100	Fed	Apparently normal after 11 days.	
Mule N	Broth culture <i>B. coli communis</i>	Feb. 9, 1919	100	Fed	Apparently normal after 11 days.	
Horse N	Broth culture Gärtner 104-B heated 60° C. half hour.	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.	
Horse P	Broth culture Gärtner QMC (H-31).	Feb. 14, 1919	100	Fed	Died 33 hours subsequent to feeding. ¹	
Horse Q	Broth culture Gärtner, Mule 11.	Feb. 14, 1919	100	Fed	Apparently normal after 11 days.	
Mule R	Broth culture (control for strain 104-B).	Nov. 30, 1918	100	Fed	Apparently normal after 11 days.	
Horse O	Filtrate Gärtner 104-B, filtered through Berkefeld.	Nov. 30, 1918	100	Fed	Apparently normal after 11 days	

¹Temperature normal on 21st (day of feeding); February 22, 8:00 a. m., 103; 3:00 p. m., 105. Pulse imperceptible; marked weakness; foul-smelling diarrhea; marked cyanosis of mucous membrane of mouth. Postmortem: Fundus² portion of stomach slightly inflamed; punctiform hemorrhages in spleen; other organs apparently normal. Organism recovered from spleen.

remained apparently normal throughout the test. This also would appear to apply to the filtrate and heated culture of the same organism, all material of strain 104-B having been used from the same flask.

Further, it would appear that *B. coli communis* had no primary significance, though it may contribute to the disease in the role of a secondary invader. The strains 141 (from the axillary vein) and Mule 11, both from spontaneous cases, but which had not been passed through small animals, and which had been carried on artificial medium, also lacked in virulence and were unable to produce perceptible changes.

The absence of death in the control animal rather hampers deductions. It is important, however, that Gartner's bacillus, strain H-31, isolated from the intestinal tract of healthy animal at Quartermaster Stable at Fort McPherson, Ga., proved fatal to experimental Horse P following fatigue. The result in this instance strongly suggests the saprophytic existence of this organism which may play a pathologic and even fatal role in carrier animals subsequent to exhaustion. It has been noted elsewhere in this report that the spontaneous disease developed only subsequent to shipment, and it is obvious that the lowered vitality or exhaustion of the animal is fundamental in the spontaneous occurrence of Gartner infection in equines.

EXPERIMENT 5-A.—In view of the fact that strain H-31 (QMC) had proved quite virulent, and being apparently the same organism as strain 104-B, it was decided to vaccinate certain of the animals remaining from Experiment 5 and to feed strain H-31 (QMC) in a further endeavor to ascertain the protective value of inoculations.

On March 4, 1919, Mule L was inoculated intravenously with 4 c.c. of a broth culture of H-31, heated at 60° C. for one-half hour, while Horse N received 8 c.c. subcutaneously. While the latter showed no change in attitude, the former after 45 minutes showed signs of depression and weakness, general muscular tremor, accelerated respiration, yawning, and a desire to lie down. The condition persisted for about one hour, after which the animal returned to an apparently normal condition. (On this date it was determined that the organism under experiment was *B. enteritidis*.)

The apparent toxicity of the killed culture prompted the inoculation, on March 7, 1919, of Horse Q, intravenously, with 4 c.c. of a germ-free filtrate of the H-31 strain, unheated. Horse O, serving as a control, received by the same method 6 c.c. of an incubated *uninoculated* quantity of bouillon which also was filtered through a

TABLE 7—SEROLOGICAL TESTS.

Tests of March 1, 1919, About Nine Days Subsequent to Experiment 5, to Determine Presence of Immune Bodies.

COMPLEMENT-FIXATION				AGGLUTINATION	
SERUM	ANTIGEN USED	TITRE	STRAINS FED	ANTIGEN USED	TITRE
Mule H	Gärtner 104-B	4+	Gärtner 104-B	Gärtner 104-B	1-200
Mule I	Gärtner 104-B	1+	Gärtner 104-B	Gärtner 104-B	1-100
Mule K	Gärtner 104-B	1+	Gärtner 104-B	Gärtner 104-B	Neg.
Mule L	Gärtner 104-B	—	Gärtner axillary vein 141	Gärtner 141	Neg.
Mule M	Gärtner 104-B	—	Coli communis	Coli communis	Neg.
Horse N	Gärtner 104-B	—	Gärtner 104-B	Gärtner 104-B	Neg.
Horse O	Gärtner 104-B	—	Filtrate 104-B	Gärtner 104-B	Neg.
Horse Q	Gärtner 104-B	—	Gärtner Mule 11	Gärtner Mule 11	Neg.
Mule R	Gärtner 104-B	—	Gärtner 104-B	Gärtner 104-B	Neg.

Tests of March 11, to Determine Presence of Immune Bodies Prior to Feeding Experiment 6.

Mule H	Gärtner OMC	4+			
Mule I	Gärtner OMC	1+			
Mule K	Gärtner OMC	2+			
Mule L	Gärtner OMC	4+			
Mule M	Gärtner OMC	—			
Horse N	Gärtner OMC	—			
Horse O	Gärtner OMC	—			
Horse Q	Gärtner OMC	—			
Mule R	Gärtner OMC	—			

Tests of March 27, Thirteen Days Subsequent to Feeding Experiment 6.

Mule H	Gärtner OMC	3+		Gärtner OMC	1-200
Mule I	Gärtner OMC	1+		Gärtner OMC	1-100
Mule K	Gärtner OMC	1+		Gärtner OMC	Neg.
Mule L	Gärtner OMC	1+		Gärtner OMC	1-200
Mule M	Gärtner OMC	1+		Gärtner OMC	1-200
Horse N	Gärtner OMC	—		Gärtner OMC	1-100
Horse O	Gärtner OMC	—		Gärtner OMC	1-100
Horse Q	Gärtner OMC	—		Gärtner OMC	Neg.
Mule R	Gärtner OMC	—		Gärtner OMC	Neg.

Those animals (H, I, K and L) which had been inoculated subcutaneously and intravenously gave signs of the presence of immune bodies, while those which had been fed persistently with large quantities failed to demonstrate such signs.

Berkefeld and not subjected to heating. Both animals prior to inoculation showed unusual liveliness, necessitating restraint.

Twenty-five minutes after the inoculations Horse Q, which had been playfully biting the control animal O, stopped suddenly, registering an expression of surprise, and walked away shaking his head. The following actions, which persisted at the end of one hour, were noted: Marked signs of uneasiness, head lowered and raised alternately, extending and flexing of legs, pawing, yawning, attempts to lie down but seeming to change his mind on each occasion, extending the legs far in front and back, not unlike a dog in the act of stretching, marked general muscular tremor, weakness in hind legs, defecation, refusal of food (though a greedy eater), and drawing up flanks as if endeavoring to evacuate bowels (an action also noticed in rats after an intraperitoneal inoculation). Pulse beat was slow though strong; little change in respiration; temperature 100.2;

mucous membranes showed nothing important. Finally the horse lay down for about 15 minutes, after which it got up and partook of a little hay. Muscular tremor, though not so pronounced, and an attitude of apprehension persisted for more than an hour. Subsequent temperatures proved normal.

Horse O showed no change.

Blood samples from those animals constituting Experiment 5 were tested 10 days later for both complement-fixing and agglutinating bodies, with the results noted in Table 7.

Attention is invited to the fact that animals H and I, which received injections of the material, and Mule K, which received immune (?) serum from Mule I, gave some reaction to the complement-fixation and agglutination tests, while animals more recently fed the culture failed to show the presence of immune bodies.

EXPERIMENT NO. 6.—In view of the fact that the animals in Experiment 5, which received the broth cultures of 104-B in the feed, showed no signs of uneasiness nor the slightest indication of illness, and the further fact that this culture had been growing nearly 3 months, it was thought that the material had decreased in virulence to such a degree as to be unable to produce the disease, though subcultures showed it to contain live organisms. Therefore it was decided to feed again the animals remaining from Experiment 5, but this time employing a culture of H-31 (QMC), the strain which had proved so virulent in the case of Horse P and which proved to be a Gartner bacillus.

Blood serum from these animals was tested serologically by both the agglutination and complement-fixation tests, using homologous antigens (for they all did not receive the same organisms) as well as an antigen made from H-31, the strain to be used at this time. The results of the serological tests may be seen in Table 7. There appeared to be no immune bodies except in the cases of those which had received previous subcutaneous or intravenous inoculations of Gartner's bacillus.

On March 12, 1919, the experiment was commenced with fasting the animals for 48 hours, at the end of which time (March 14) each was fed with 100 c.c. of a serum-broth culture of strain H-31, as indicated in Table 8, with the exceptions of Horse O, which received a germ-free filtrate of the same culture, and Horse Q, which received the same amount of a broth culture which had been heated to 60° C. for one-half hour.

The following morning the animals showed a slight rise in tem-

perature, dejected appearance, and refused their morning meal, which, however, they consumed in small quantities during the forenoon. There was an improvement by night, and all appeared normal on the third day after the inoculation.

While it would appear strange that some of these animals did not succumb to the malady after having been fed an organism which had proved of high virulence a few days previously, it may have been that they were rendered more or less immune, not only by the several subcutaneous and intravenous inoculations of some, but also by the feeding of the culture 104-B in Experiment 5, which, while not proving sufficiently virulent to produce death, may have stimulated an immunity or intestinal tolerance sufficiently strong to combat the subsequent feeding of the virulent culture of H-31. Quoting from Park and Williams,⁷ that "feeding *does* produce immunity in experimental animals," it is thought that this theory deserves consideration.

FEEDING EXPERIMENT NO. 7.—In this experiment three freshly prepared serum-bouillon cultures of Gartner's bacillus, strains No. 1, 104-B, and QMC (or H-31), were fed to ascertain if they would also prove capricious in toxicity, and to study further the serological phase; also to ascertain whether *B. paratyphoid B*, so like Gartner's bacillus culturally, and *B. paracolon*, which seemed similar serologically, would also produce the clinical picture of the spontaneous disease under consideration; and further, to determine whether the intravenous inoculation of Mule L with 4 c.c. of the strain H-31 (QMC) on February 21 and a feeding of 100 c.c. of the same strain March 14, 1919, and the unsuccessful feeding of Mule M with 100 c.c. of a culture of H-31 on March 14, 1919, would render them both immune to subsequent feeding of virulent organisms.

From a perusal of Table 9 it will be seen that the three strains of *B. enteritidis* (Gartner) did prove virulent in the cases of S, T and U, and these animals displayed the identical clinical picture viewed in spontaneous cases, i. e., depression, pendulous lower lip, cyanotic mucous membranes, profuse ill-smelling diarrhea, elevated temperatures, and finally exhaustion and death.

Mule X, which received a culture of *B. paratyphoid B*, succumbed the day following feeding and presented the typical picture of the affliction being studied.

Mule V, which received the Army Medical School strain of *B. paracolon*, failed to succumb or show uneasiness, whereas Horse W, which was fed the Parke-Davis strain of the same organism, showed

TABLE 8.—FEEDING EXPERIMENT No. 6.
Animals fasted 48 hours beginning March 12, 1919; fed cultures March 14.

ANIMAL	MATERIAL		QUANTITY	METHOD	RESULTS
	CULTURE	AGE			
Mule H	Broth culture Gärtner H-31.	48 hours	C. C.	Fed	Normal.
Mule I	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
Mule K	Serum from Mule H.	48 hours	100	Intravenous	Normal.
Mule L	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
	Vaccinated with culture H-31 (60° C., half hour) ¹ .	48 hours	4	Intravenous	Normal.
Mule M	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
Mule N	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.
	Vaccinated with culture H-31 (60° C., half hour) ¹ .	48 hours	4	Subcutaneous	Normal.
Horse O	Broth culture H-31.	48 hours	100	Fed	Normal.
	Bouillon filtrate (plain) control on Q ² .	48 hours	6	Intravenous	Normal.
Horse Q	Bouillon filtrate H-31 (Berkefeld).	48 hours	100	Fed	Normal.
	Bouillon filtrate H-31 (Berkefeld).	48 hours	4	Intravenous	Normal.
Mule R	Broth culture H-31 heated to 60° C., half hour.	48 hours	100	Fed	Normal.
	Broth culture Gärtner H-31.	48 hours	100	Fed	Normal.

¹Mule L after vaccination showed general muscular tremor, yawning, restlessness, frequently lying down, stretching, defecation. Horse N, the control, remained normal. These animals were vaccinated March 4.

²Inoculated March 7 (see Experiment 5-A).

depression, weakness, and a diarrhea, which persisted for 4 days, when the animal became moribund, dying on the fifth day after feeding. This animal did not demonstrate any symptoms other than listlessness, elevated temperature, diarrhea and loss of appetite. The mucous membranes remained unchanged in contradistinction to the others receiving Gartner's bacillus. This animal on postmortem showed a well-marked enteritis, due undoubtedly to the length of time it was afflicted.

Postmortem on animals which had suffered acutely failed to produce anatomical alterations other than a slight inflammation of the small intestines.

Horse Y, which received a larger quantity of *B. coli communis* (as this organism was ever present in spontaneous cases), showed nothing other than a rise in temperature on the third day.

Mules L and M, which had been treated previously with *B. enteritidis* (Gartner), seemed to display a well-marked immunity, evidenced by the fact that they received like amounts of the same organism fed others of this test which succumbed. Their serum titrated but 1-50 and 1-66.

Despite careful technic, the organism could not be recovered from Horse U, which had received the QMC strain of Gartner's bacillus. Cultures were made from all organs and heart blood.

The organisms fed were recovered from other cases which succumbed.

SMALL ANIMAL INOCULATION EXPERIMENTS

Three guinea pigs, three rats, and three mice were injected intraperitoneally and subcutaneously with surface growths of Gartner's bacillus in normal salt solution. The amounts injected varied in different animals, from 0.2 to 0.05 c.c., as shown in Table 10. Mice proved more susceptible than did rats or guinea pigs and were more acutely afflicted, death following in from 2 to 4 days. Rats and guinea pigs succumbed after a varying period of incubation. Only those animals succumbing in a short time yielded positive cultures from their several organs.

The toxin alone was found pathogenic for mice when inoculated in small doses.

RABBIT INOCULATION EXPERIMENT, December 2, 1918.—Nine rabbits varying in weight from 963 to 1368 grams were injected subcutaneously, intraperitoneally and intravenously with varying

TABLE 9.—FEEDING EXPERIMENT No. 7.
Animals fasted beginning May 19, 1919, fed May 21, 1919.

ANIMAL	MATERIAL FED	AMT.	TEMPERATURES															
			20		21		23		23		24		25		26			
			a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.	a. m.	p. m.
Horse S	Gärtner No. 1	c.c. 100	100.	99.8	99.6	100.	105.	Dead										
Mule T	Gärtner 104-B	100	99.2	99.6	99.4	99.8	103.2	Dead										
Horse U	Gärtner QMC	100	99.6	99.4	99.2	99.8	104.8	105.	104.	104.4	106.4	Dead						
Mule V	Paracolon, Army Med. School	100	100.4	100.	100.	100.6	100.4	102.	102.2	100.	101.1	101.	100.	101.	99.			
Horse W	Paracolon, Parke-Davis	100	101.2	100.8	100.	100.4	103.	106.	104.2	105.6	104.	104.2	105.	105.	103.	Dead		
Mule X	Paratyphoid B	100	99.4	99.8	99.6	100.	103.4	Dead										
Horse Y	Coli communis	150	98.2	99.	98.8	99.6	102.	103.	100.2									
Mule M Control	Gärtner No. 1	100	99.	99.4	98.8	99.6	102.2	103.4	102.									
Mule L Control	Gärtner QMC	100	98.8	99.	98.6	99.4	100.	100.2	101.									

amounts of the surface growth in sterile normal salt solution of strain 104-B. Death followed, with one exception, in 2 to 14 days. It is noted that the intravenous injection into rabbits proved more rapidly fatal than did the intraperitoneal or subcutaneous injections, and in subsequent inoculations of small animals a variability of susceptibility was noted. A fatal injection for one animal proved harmless to another. (See Table 11.)

GUINEA-PIG FEEDING EXPERIMENT, April 17, 1919.—From the following feeding experiment it may be seen that susceptible animals may be killed by feeding Gärtner's bacillus and allied organisms, but that the organisms may not be recovered in every instance. Two of the animals receiving cultures of *B. enteritidis* failed to succumb, demonstrating the variability either in toxicity of the organism or in resistance of the individual. These same organisms were virulent when inoculated intraperitoneally into guinea pigs. It further demonstrates the fact that, in peracute cases, the postmortem findings are practically nil, a condition so frequently met with in horses.

In no case of this experiment were the several organisms recovered. It might be said that the disease, in these instances, was too

TABLE 9.—FEEDING EXPERIMENT No. 7.—Continued.
Animals fasted beginning May 19, 1919, fed May, 21 1919.

ANIMAL	SEROLOGICAL TESTS				REMARKS
	BEFORE		AFTER		
	Comp. Fix.	Agglutination	Comp. Fix.	Agglutination	
Horse S	Negative	Negative at 1-50	Negative	Positive at 1-50, Negative at 1-66	May 22, 10:00 a. m., down; imperceptible pulse; mucous membrane cyanotic; 11:00 a. m., dead.
Mule T	Negative	Negative at 1-50	Negative	Negative at 1-50	May 22, 10:00 a. m., same as above; May 22, 12:00 a. m., dead; clinical picture same as above.
Horse U	Negative	Negative at 1-50	Negative	Negative at 1-50	May 22, sick; May 23, sick; May 24, clinical picture above; dead.
Mule V	Negative	+— 1-50	1+	Positive at 1-100	May 22, a little indifferent; May 23, normal; May 27, released from test.
Horse W	Negative	Positive 1-50	Negative	Negative at 1-50	May 22, 10:00 a. m., sick; May 26, moribund; weak; loss of appetite, but mucous membrane not cyanotic; died.
Mule X	1+	Positive 1-50	2+	Negative 1-50	May 22, sick, 2:00 p. m., respiration 40; cyanotic mucous membrane; same picture as in Gärtner infection; dead.
Horse Y	Negative	Negative 1-50	Negative	Negative 1-50	May 22, apparently normal; May 27; released from test.
Mule M Control	Negative	+— 1-50	Negative	+— 1-50	May 22, signs of indifference; May 24, apparently normal; May 27, released from test.
Mule L Control	Negative	+— 1-50	Negative	Positive 1-66	May 22, apparently normal; May 27, released from test.

acute, but, conversely, Horse P of Experiment 5 died in 33 hours after feeding and the organism was recovered from the spleen. Further, the blood serum of those two animals which remained alive demonstrated *no agglutinins* for *B. enteritidis* (Gartner). (See Table 12.)

GUINEA-PIG FEEDING EXPERIMENT, April 28, 1919.—Again, the variability of toxicity and individual susceptibility is shown by an experiment in which six guinea pigs were fed varying amounts of pooled bouillon cultures of different strains of *B. enteritidis* (Gartner). It will be seen from Table 13 that but three of this number died and cultures from the various organs in two instances failed to demonstrate the organisms artificially administered in the feed. Postmortem examination revealed no anatomical changes. Animals Nos. 1, 2 and 6 were apparently healthy after 19 days. Blood from these three failed to show the presence of agglutinins.

In view of this and previous experiments, the failure to demonstrate the presence of immune bodies in acute sporadic cases in equine would not appear so disconcerting.

TABLE 10—GUINEA-PIG, RAT AND MOUSE INOCULATIONS, GARTNER'S BACILLUS, STRAIN "Rv," DECEMBER 17, 1918.

ANIMAL	WEIGHT	QUANTITY AND METHOD	DATE OF DEATH
	Grams		
Guinea Pig	260	.01 c.c. intraperitoneally	January 12, 1919
Guinea Pig	300	.02 c.c. intraperitoneally	January 4, 1919
Guinea Pig	210	.02 c.c. subcutaneously	December 28, 1918
Rat	90	.05 c.c. intraperitoneally	December 25, 1918
Rat	90	.01 c.c. intraperitoneally	December 23, 1918
Rat	90	.01 c.c. subcutaneously	January 3, 1919
Mouse		.05 c.c. intraperitoneally	December 19, 1918
Mouse		.01 c.c. intraperitoneally	December 18, 1918
Mouse		.01 c.c. subcutaneously	December 21, 1918

These feeding experiments of small animals were performed to endeavor to gauge a dose for future immunity experiments, but this method of infecting was not found practicable.

GUINEA-PIG INOCULATION EXPERIMENT, May 7, 1919.—The infection of small animals by feeding proving too unreliable, the following inoculation experiment was conducted in order to arrive at a lethal dose to be employed in a subsequent protective experiment. It will be seen from Table 14 that the animals died in rotation, according to the amount of organism inoculated. While it appears at the present time that a much smaller dose might have been employed with greater success in the experiment to follow, notwithstanding, the dose of 1 c.c. was selected as a standard.

GUINEA-PIG INOCULATION EXPERIMENT, May 26-27, 1919.—Having decided upon the use of 1 c.c. of a standard suspension of strain No. 1 of Gartner's bacillus as the amount for an immunity experiment, 22 apparently normal guinea pigs were selected and inoculated

TABLE 11—RABBIT INOCULATION EXPERIMENT, GARTNER 104-B, DECEMBER 2, 1918.

NUMBER	WEIGHT	DOSE	DATE OF DEATH	RESULTS
	Grams			
249	1,063	1 c.c. subcutaneously	Dec. 15, 1918	Abscess at point of inoculation, extending full length of abdomen. Pneumonia in right lobe of lung.
250	1,453	2 c.c. subcutaneously	Dec. 8, 1918	Infiltration of subcutaneous tissue at point of inoculation with thick gelatinous exudate.
251	1,643	1.5 c.c. subcutaneously	Dec. 11, 1918	No autopsy.
252	1,100	0.1 c.c. intraperitoneally	Dec. 6, 1918	Pleuro-pneumonia; 5 c.c. seropurulent exudate in left pleural cavity; streptococcus in stained smears of heart blood.
253	867	0.15 c.c. intraperitoneally	Dec. 10, 1918	Same as 252. Inoculation proved to be intramuscular.
254	1,868	0.2 c.c. intraperitoneally	Dec. 4, 1918	No lesions observed. Gram negative bacilli in heart blood.
255	1,138	0.1 c.c. intraperitoneally	Dec. 5, 1918	No specific lesions observed. Heart blood negative.
256	1,100	0.15 c.c. intravenously	Dec. 4, 1918	No lesions noted on postmortem. Gram negative bacilli in heart blood.
257	963	0.2 c.c. intravenously	Dec. 6, 1918	No lesions noted on postmortem. Gram negative bacilli in heart blood.

TABLE 12—GUINEA-PIG FEEDING EXPERIMENT, APRIL 17, 1919.

NO.	WEIGHT	SUSPENSION	AMOUNT	DATE OF DEATH	RESULTS
1	Grams 143	Gärtner's bacillus 104-B	c.c. 3.5	1919 April 21	Postmortem: Few punctiform hemorrhages in mucous membrane of stomach; small pneumonic area in lower left lobe of lung. Cultures on endo and blood negative.
2	120	Gärtner's bacillus, axillary vein	2.0	April 20	Postmortem: Slight congestion of lower right lobe of lung; other organs normal. Cultures on blood and endo negative.
3	200	B. paratyphoid B	2.0	April 21	Postmortem: Slight congestion of lower left lobe of lung. Cultures on endo and blood negative.
4	280	Gärtner's bacillus, QMC	2.0		Alive at end of 8 days and apparently healthy. Blood serum demonstrated no agglutinins.
5	287	Gärtner's bacillus No. 1	2.0		Alive at end of 8 days and apparently healthy. Blood serum demonstrated no agglutinins.
6	215	B. coli communis	4.0	April 21	Postmortem: All organs apparently normal. Cultures on endo and blood negative.

intraperitoneally with varying amounts of immune serum. This serum had been prepared in rabbits and showed a high agglutinating titre. (See Table 22 under "Agglutination Tests.")

Twenty-four hours after administration of the serum 1 c.c. of a standard suspension of *B. enteritidis* (Gartner) was inoculated intraperitoneally. The control animals which received no serum died 12 hours later. Animal No. 310 also died the following day. The organism was not recovered from the heart blood. The animals lived for varying intervals of time, the last succumbing 10 days later. All animals showed marked hemorrhagic infiltration at the point of inoculation and in some instances an enlarged spleen. No other anatomical changes were noticed.

TABLE 13—GUINEA-PIG FEEDING EXPERIMENT, FOUR STRAINS OF GARTNER'S BACILLUS, 104-B, Sp.-2, RV, QMC, POOLED. APRIL 28, 1919.
Pigs Weighed Approximately 150 Grams.

NUMBER	AMOUNT	DATE OF DEATH	RESULTS
1	c.c. 2		Alive May 15, 1919. Bled and agglutinated; results negative.
2	2		Alive May 15, 1919. Bled and agglutinated; results negative.
3	3	May 11, 1919	Postmortem. No anatomical changes. Cultures from all organs on blood and endo negative.
4	3	May 7, 1919	Postmortem: No anatomical changes. Cultures from all organs on blood and endo positive.
5	4	May 13, 1919	Postmortem: No anatomical changes. Cultures from all organs on blood and endo negative.
6	4		Alive May 15, 1919. Bled and agglutinated; results negative.

TABLE 14—GUINEA-PIG INOCULATION EXPERIMENT (INTRAPERITONEALLY) TO DETERMINE LETHAL DOSE.

Agar Culture, 48-Hour Growth, Standardized, Gartner No. 1. Inoculated May 7, 1919.

NUMBER	WEIGHT	AMOUNT	DATE OF DEATH	RESULTS
301	Grams 350	c.c. 0.5	May 13, 1919	Postmortem negative. Organism recovered from all organs. Lived 144 hours.
302	340	1.0	May 10, 1919	Postmortem negative. Recovered from all organs. Lived 72 hours.
203	350	1.5	May 9, 1919	Postmortem. Subcutaneous hemorrhagic infiltration; axillary gland hemorrhagic. Recovered from all organs. Lived 40 hours.
304	372	2.0	May 8, 1919	Postmortem: Subcutaneous hemorrhagic gelatinous infiltration; organs normal. Recovered from all organs. Lived 18 hours.
305	200	2.0	May 8, 1919	Postmortem negative. Recovered from all organs. Lived 24 hours.

It will be noticed that the serum dose was rather small, due to the scarcity of the serum, and whether the prolongation of life demonstrated virtue in the serum or whether it was merely a demonstration of the Pfeiffer phenomenon is questionable.

Serums Nos. 3 and 1 were from rabbits which received Berkefeld filtered bouillon cultures of Gartner's bacillus. (See Table 22 under "Agglutination Tests.")

Details of this experiment are given in Table 15.

TABLE 15—GUINEA-PIG INOCULATION EXPERIMENT (PROTECTIVE).

Agar Cultures Gartner No. 1, 48-hour Growth, Standardized. Animals Inoculated with Serum May 26, 1919. Inoculated with Bacteria May 27, 1919.

No.	SERUM		Bacterial Suspension	Date of Death	RESULTS
	Amount	Strain			
309	c.c. 0.5	No. 5	c.c. 1	June 4, 1919	Hemorrhagic infiltration at site of inoculation. Organisms recovered from all organs.
310	1.0	No. 5	1	May 28, 1919	Postmortem same. Organisms recovered. Heart blood negative.
311	1.5	No. 5	1	June 2, 1919	Postmortem same. Organisms recovered from all organs.
312	2.0	No. 5	1	June 1, 1919	Postmortem same. Organisms recovered from all organs.
313	3.0	No. 5	1	June 2, 1919	Postmortem same. Organisms recovered from all organs.
314	0.5	No. 1	1	June 5, 1919	Postmortem same. Organisms recovered from organs.
315	1.0	No. 1	1	June 4, 1919	Postmortem same. Organisms recovered from organs.
316	1.5	No. 1	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
317	2.0	No. 1	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
318	3.0	No. 1	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
319	0.5	Nos. 3 & 7	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
320	1.0	Nos. 3 & 7	1	June 5, 1919	Postmortem same. Organisms recovered from organs.
321	1.5	Nos. 3 & 7	1	June 5, 1919	Postmortem same. Organisms recovered from organs.
322	2.0	Nos. 3 & 7	1	May 31, 1919	Postmortem same. Organisms recovered from organs.
323	3.0	Nos. 3 & 7	1	May 31, 1919	Postmortem same. Organisms recovered from organs.
324	0.5	Horse N	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
325	1.0	Horse N	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
326	1.5	Horse N	1	June 2, 1919	Postmortem same. Organisms recovered from organs.
327	2.0	Horse N	1	June 4, 1919	Postmortem same. Organisms recovered from organs.
328	3.0	Horse N	1	June 1, 1919	Postmortem same. Organisms recovered from organs.
*329	None	.....	1	May 28, 1919	Hemorrhagic infiltration at site of inoculation. Organisms recovered.
*330	None	1	May 28, 1919	Hemorrhagic infiltration at site of inoculation. Organisms recovered.

*Controls.

(To be continued.)

POTASSIUM IODIDE IN MALNUTRITION OF PIGS

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EARLY in the fall, the owner of a herd of hogs in the foothill district of the Sacramento Valley reported a disease among his suckling pigs, which he described as follows:

When about three days old, scalded-like areas appeared around the mouth, on face and ears. These did not penetrate the skin, nor resemble the lesions of necrobacillosis. There was a distinctly noticeable enlargement in region of the thyroids. While retaining a good appetite, they became emaciated, the skin developed a scurvy-like surface, was wrinkled all over the body, and was hard to the touch. These symptoms progressed with increasing weakness, until the pigs finally lay on their sides, unable to rise, and died in the course of a couple of days more.

About fifty pigs, all belonging to six sows, that had farrowed about the same time, were affected without an exception. The course of the disease appeared to be from two to six weeks. The mothers remained healthy, as did all the other hogs of various ages on the place. There was no history of cholera in the vicinity. The affected pigs retained clear eyes; there was no reddish discoloration of the skin, nor were the typical internal lesions of cholera present.

The condition suggested some form of malnutrition, and called to mind the article by E. B. Hart and H. Steenbock, of Wisconsin Laboratory of Agricultural Chemistry, on Thyroid Hyperplasia and Relation of Iodine to the Hairless Pig Malady in the *Journal of Biological Chemistry*, February, 1919, and a succeeding article in the *JOURNAL* of the A. V. M. A. by Howard Welsh, of Bozeman, Montana, in which he stated that iodine is a specific prevention for hairless pigs and goitre in lambs and calves.

Accordingly it was advised that about two grams of potassium iodide be dissolved in water and mixed with mash and fed to the sows and litters daily.

The owner reported that 21 head were lost until time of treatment, when almost immediate improvement was noticed and continued until the situation was entirely cleared.

This report is submitted as a corroboration of the articles above mentioned.

ABSTRACTS

A FILTER-PASSING VIRUS IN CERTAIN DISEASES.. By Sir John Rose Bradford. Royal Inst. of Great Britain, May 30, 1919. Reprint, 13 pp. A presentation of the work carried out during the last two years in the British Expeditionary Force in France, with the co-operation of Captains J. A. Wilson and E. F. Bashford on the etiology of such diseases as influenza, rabies, nephritis, poliomyelitis, etc.

The results of the work carried out at Etaples may be summarized as follows: Filter-passing organisms have been isolated by culture from the blood and from the secretions of the body in a considerable number of diseases of obscure origin. These organisms fall into two definite groups. The first and smaller group consists of those entitled to be called globoids. The second and much more numerous group is that of the true filter-passers. The so-called globoids are characterized especially by the fact that on staining they show a distinct differentiation into a central darkly-staining and a peripheral less stainable zone. The latter has often a somewhat indefinite outline, so that it is difficult to separate with sharpness one individual from its neighbors. The non-globoid filter-passers are, on the other hand, extraordinarily sharply defined, although often extremely minute. The different members of this series present individual morphological differences.

The dimensions of the different organisms isolated are as follows: Rabies, rounded body, diameter 0.1 to 0.3 micron. Influenza, rounded or oval coccus-like body, 0.15 to 0.5 micron. Trench fever and nephritis, 0.3 to 0.6 micron. The organisms isolated in polyneuritis and encephalitis are definite globoids varying in size from 0.2 to 0.5 micron.

The filter-passing virus of some of these diseases is unquestionably conveyed from the sick to the healthy through the agency of insects.

W. N. BERG.

DISCOVERY OF A CASE OF GLANDERS IN MAN THROUGH SERUM DIAGNOSIS. By Staff Veterinarian Breithor. In Ztschr. Veterinärk, Feb., 1919.

The animal blood testing station No. 6 received a sample of blood from a soldier to be tested for glanders with the following history:

A teamster had handled a horse with nasal glanders. He became ill and was admitted to the hospital suffering apparently with symptoms of pleuropneumonia. After 14 days of sickness the patient apparently was again well. Later, swellings appeared on both ankles and one of these developed into an abscess. Along with this the patient had an intermittent fever. This last symptom suggested the thought of glanders. The blood test showed the following: 0.5 c.c. of serum gave complete fixation of complement; 0.01 c.c. incomplete fixation; agglutination 500.

As a control of the test, serum from another soldier who was suffering with pleurisy was used, and this came negative.

Subsequently a decided improvement in the condition of the patient took place. He walked about without difficulty. Six weeks later, however, he became decidedly worse. Clinical examination gave a negative result.

The blood test applied again resulted in 0.1 c.c. serum giving complete fixation of complement; 0.02 c.c. incomplete fixation; negative agglutination.

Later on nodules the size of a pea appeared in the shoulder region. Fourteen days later the patient died. On postmortem the following was noted: Scars on the nasal mucous membrane; acute inflammation of the nasal mucous membrane; an abscess in the right lung the size of a pea. Heart normal. Swelling of testicles. Many circumscribed brown nodules in the skin of the shoulder region. Diagnosis, glanders.

H. W. SCHOENING.

REVIEWS

SURGICAL AND OBSTETRICAL OPERATIONS. By W. L. Williams, Professor of Obstetrics and Research, New York State Veterinary College, Cornell University. Fourth edition, revised, pp. 196. Published by the author, Ithaca, N. Y., 1919.

The fourth edition of "Surgical and Obstetrical Operations" by Prof. W. L. Williams, of Cornell University, has just been published, with the collaboration of Dr. James N. Frost, Professor of Surgery, of the same college. The fact that this little book has gone to the fourth edition alone shows its worth and appreciation by the veterinary profession. While this work is intended as a students' guide, the average busy practitioner who is required to do his own operating will find in it a wealth of condensed information.

The technique of 59 operations is described and well illustrated.

The operation selected for description is usually that one which has been found by the author's long surgical experience to be practical. Several operations not appearing in former editions are described, including dehorning, rumenotomy, resection of intestines, and cryptorchid operation. Trephining of the facial sinuses is especially well described and illustrated. The operation for roaring has been brought up to date and is well illustrated. More modern operations for several diseases or conditions are described.

The book is smaller in size than former editions, but contains more text and many more illustrations. Altogether this small book is one of the most useful that the veterinarian can own.

J. P. T.

VETERINARY OPHTHALMOLOGY. By Dr. Eugène Nicols, Veterinary Major, French Army. Translated, edited and enlarged by Henry Gray, M. R. C. V. S. Pp. 598. Printed and published by H. W. Brown, 20 Fulham Road, London, S.W., 1914.

"Veterinary Ophthalmology" is a valuable contribution to veterinary literature; it is a thoroughly scientific and complete discussion of diseases of the eye in domestic animals. Evidently the author has had a wide experience, which has been supplemented with numerous references and illustrations from the best continental authorities to produce a book of great value.

There are nearly 600 pages divided into 16 chapters. The first 4 chapters, 100 pages, are devoted to anatomy, refraction, methods of examination, use of the ophthalmoscope, etc. The chapter on refraction is rather complex and will be of no great value to the average veterinarian. Methods of examination and the use of the ophthalmoscope are clearly presented and well illustrated. Directions for the use of the ophthalmoscope to recognize turbidities of the media are excellent, though the author omits mention of the very useful and inexpensive retinoscope for illumination of turbidities of the vitreous humor, where it is superior to the ordinary ophthalmoscope.

While the text is excellent throughout, the discussions of symptoms and treatment will appeal very strongly to clinicians. Nearly 100 pages are devoted to the uveal tract, and to anyone who has given much attention to diseases of the eye in animals this is a highly interesting and instructive chapter. Irido-cyclitis in all its clinical forms is described clearly and in great detail. One short paragraph describes traumatic irido-cyclitis due to contusion without

a wound, the possibility of its occurrence, its causes and symptoms. (It is an interesting coincidence that the reviewer was interrupted at this point to treat a case of traumatic irido-cyclitis in a cow caused by a blow with a blunt object that failed to produce any external injury.) Periodic ophthalmia receives a very thorough and exact description; the part devoted to treatment is especially fine. The author describes about every form of therapeutics that has been tried, but does not mention the injection of Lugol's solution into the supraorbital fat, a treatment that has found considerable favor in America during the past few years.

It is stated that contagion has not been proved in epizootic keratitis in cattle; evidently the author has not had a wide experience with this disease. After seeing it extend rapidly from herd to herd following the introduction of an infected cow from a distant stockyard it is difficult to imagine any other means of extension.

The book is convenient in size and the publishers have adopted a high standard of material and workmanship. D. H. U.

STUDIES ON ACARI. No. 1.—THE GENUS *DEMODOX* OWEN. By Stanley Hirst, Assistant in the Department of Zoology, British Museum. V+44 pp., 4 figs., 13 pls., 53 figs., quarto. British Museum (Nat. Hist.), London.

Hirst has discussed all the known species and varieties of the follicular mites of the genus *Demodex*. He states that these mites are usually quite innocuous, being of common occurrence in apparently healthy and normal animals, but notes the records of various authors who have found *Demodex* in association with acne rosacea, localized pigmentation, lichen spinulosus, blepharitis, impetiginous eruptions, seborrhea, maculose skin complaints, cancer, and conditions resembling alopecia areata, molluscum contagiosum and tinea versicolor. Demodectic mange in the dog, cat, horse, cattle, pigs and goats is discussed at some length and some of the treatments used are given. Hirst has never found the mites on the skin or attached to the hairs of the host, the mode by which the mites are disseminated being yet uncertain.

Hirst regards the Demodicidæ as a degenerate branch of the Cheletidæ. Contrary to what is commonly stated of *Demodex*, he finds the internal tracheæ noted by Csokor. These are of a type similar to that in the Cheletidæ, and have their apertures in the ventral surface of the capitulum. A dorsal spine on the proximal segments of the palpi is regarded as a feature of value in the differ-

entiation of species, but the reviewer does not find that the descriptions of these spines lend themselves readily to the compilation of a key. Hirst agrees with Berlese that the legs have five segments and not three as is usually stated. In disagreement with much that has been written on this subject, he finds that the penis is a comparatively large, slender, rodlike structure, usually consisting of two parts and protrusible through an aperture on the dorsal surface of the cephalothorax, usually above the interval between the first and second legs or slightly anterior of this point.

Hirst gives a list of the known species and varieties with their hosts and distribution, and gives descriptions of the species with figures of those examined by him. He does not give the measurements of the penis for all of the involved species, even where he has seen and described it, though this structure might be of considerable specific value in this group as it has been in the nematodes. There are also some misstatements and some confusing statements, evidently inadvertent. Thus on page 14 we note: "The second and third segments [of the palpi] are freely movable. There is a well marked tubercle or spine in this segment." The spine, it appears, is on the first or proximal segment. On page 30 is the statement regarding *D. muscardini*: "Width of cephalothorax a little more than four times up to four and a half times the total length of the body." The reverse of this statement appears to be true. The follicular mite of man is referred to on page 19 as *Acarus folliculorum* Simon, 1843. The evidence available to the reviewer indicates that this date should be 1842.

It is to be regretted that Hirst did not compile a key to the species of *Demodex*. Such keys are a great aid to other workers and can be best prepared by those who have worked out the involved species, as Hirst has. It is possible that Hirst did not find that a satisfactory key could be compiled, and this is probably true, as the genus, so far as may be judged from Hirst's monograph, is still separated, largely on a basis of hosts, into species or varieties that grade into one another with overlapping features as regards practically all of the structures that may be considered as of possible specific value.

M. C. H.

ARMY VETERINARY SERVICE

NEWS FROM THE SURGEON'S OFFICE

NUMBER OF VETERINARY OFFICERS ON DUTY

THE Office of the Surgeon General of the United States Army has furnished the following information as to veterinary officers on duty.

Officers, Veterinary Corps, United States Army, with temporary rank as authorized by Congress in act providing for 18,000 officers until June 30, 1920, on duty on dates shown:

	Dec. 11, 1919	Jan. 11, 1920
Colonels	0	0
Lieutenant Colonels	4	4
Majors	37	35
Captains	72	73
First Lieutenants	156	148
Second Lieutenants	72	76
	<hr/>	<hr/>
Totals.....	341	337

Officers, Veterinary Corps, Regular Army, with permanent rank under act of June 3, 1916, on duty January 11, 1920:

Majors	7
Captains	17
First Lieutenants	21
Second Lieutenants	47
	<hr/>
Total.....	92

TRANSFERS AND REASSIGNMENTS

The following orders of transfer and reassignment have been issued for veterinary officers:

Captain Hume F. Spencer, V. C., from Camp Funston, Kans., to Camp Upton, N. Y., as Camp Veterinarian.

Captain H. H. Howe, V. C., from Remount Depot, Camp Gordon, Ga., to Remount Depot, Camp Grant, Ill., for duty as the Veterinarian.

Captain F. C. Sager, V. C., from Camp Grant, Remount Depot, to Chicago, Ill., for instruction in meat inspection.

Captain C. C. Bourland, V. C., from Fort Bliss, Tex., to Department Laboratory, Philadelphia, Pa., for course of instruction.

Captain J. L. Ruble, V. C., from Chicago, Ill., to Fort Brown,

Brownsville, Tex., for duty as Post Veterinarian, and Brownsville District, Brownsville, Tex., for duty as District Veterinarian.

Captain E. P. O'Connell, V. C., from Chicago, Ill., to Fort Sam Houston, Tex., for duty as Post Veterinarian.

Major F. C. Hershberger, U. S. A., from Camp Upton, N. Y., to Marfa, Tex., as District Veterinarian, Big Bend District, and Camp Veterinarian, Marfa, Tex.

Major W. B. Cook, U. S. A., from Camp Travis, Tex., to Douglas, Ariz., for duty as District Veterinarian and Camp Veterinarian, Camp Harry J. Jones, Douglas, Ariz.

Major G. H. Koon, U. S. A., from Chicago, Ill., to Washington, D. C., for duty in the Surgeon General's Office.

CARY CALLS COMMITTEE ON LEGISLATION

PRESIDENT C. A. CARY, who had been in attendance at the Ohio State Veterinary Medical Association meeting in Columbus, reached Washington, D. C., on January 17, for the purpose of investigating the progress being made by the Congressional committees in the reorganization of the Veterinary Corps. He was accompanied by Dean D. S. White of Columbus, whose military experience as Colonel in the Veterinary Corps proved of great assistance to Dr. Cary in discussing the military phases of this subject with the Congressmen interviewed. As a result of these conferences President Cary became so deeply impressed with the need of immediate action that he wired the various members of his Legislative Committee to meet him in Washington on January 21. Drs. Turner, Walkley, Hoskins, and Munce responded and together with S. E. Bennett and representatives of the Army and the B. A. I., the ways and means of obtaining appropriate consideration for members of our profession in the Army were fully discussed and then presented in forceful argument to various members of Congress. It was predicted that much good will be accomplished by this concerted action of our fellow members.

REORGANIZATION OF THE VETERINARY CORPS

The reorganization of the Veterinary Corps at this time is a matter of utmost importance, not only to the Army but to the entire profession in the United States. It is vital that the veterinary profession be recognized in the Army on a parity with the other professional and technical services, so that its officers may be given the

same consideration with regard to rank and an adequate enlisted force of assistants. However, if the present provisions of Senate Bill 3688, introduced January 9, 1920, remain unchanged, the Corps, instead of receiving the recognition accorded to all other professional services, will be classed with the only nonprofessional service in the Medical Department, the Medical Administrative Corps (the present Sanitary Corps). The Medical and Dental Corps officers in this bill enter with the grade of first lieutenant and are promoted through the grades to colonel after 26 years' service. The Veterinary and Administrative Corps officers enter as second lieutenants and are promoted to the grade of major after 20 years' service, except that officers of the Veterinary Corps may reach the grade of lieutenant colonel after 25 years' service.

It is not conceivable that such lack of consideration will be allowed to pass unchallenged by the profession in America. No other profession gave more willingly of its services to the country during the war. The Corps was organized under many handicaps, and, in spite of the seemingly insurmountable difficulties, the signing of the armistice found it functioning as a professional medical service both in this country and in France.

Section 33 of the proposed Senate Bill reads as follows: ¹

"The Veterinary Corps shall consist of one hundred and fifty commissioned officers in grades from second lieutenant to lieutenant colonel, inclusive. Hereafter commissioned officers of the Veterinary Corps shall be promoted, if in Class A as provided for in Section 44 of this Act, to the grade of first lieutenant upon the completion of five years' service, to the grade of captain upon the completion of ten years' service, to the grade of major upon the completion of twenty years' service, and to the grade of lieutenant colonel upon the completion of twenty-five years' service. * * * *Provided*, That not to exceed 1,500 of said enlisted force shall be assigned to duties related to the Veterinary Corps."

There are now 340 veterinary officers on duty, and the demands of the War Department can not be complied with in so far as the supplying of officers is necessary to give veterinary service to the entire Army. It is beyond our power of vision to see how this work is to be accomplished by only 150 officers. In order to meet the needs of the Army proposed by this bill the Corps will require not less than 340 officers in grades from first lieutenant to colonel, inclusive, with promotions similar to those provided for the medical and

¹ An amended bill, S. 3792, was introduced on Jan. 23, 1920, which removes practically all these unsatisfactory features.

dental officers and chaplains; also 3,000 enlisted men in the established grades.

The House Military Committee is in session daily also considering the draft of a bill for the reorganization of the Army. The proposed measure is virtually a revision of the National Defense Act to try to meet the present needs of the Army. It differs greatly from the Senate Bill, which includes provision for universal military training. The Veterinary Corps is provided for in Section 10 as follows:

"The Veterinary Corps shall consist of 140 officers in grades from major to second lieutenant."

Note that *no enlisted men are provided.*

To meet the needs of the Army proposed by the House Military Committee the Veterinary Corps will require approximately 340 officers in grades from first lieutenant to colonel, inclusive, and 3,000 enlisted men. There are no enlisted men provided in the House Military Committee draft, and the Veterinary Corps can not function as such without this personnel. They can not be obtained by detail from other service; for example, a remount depot has only enough men in the Quartermaster Corps to take care of the management, handling and training of the remounts, and they are generally undermanned. How can men under such circumstances be detailed to do the veterinary work?

The simplest and easiest method by which enlisted men could be provided for the Veterinary Corps would be to increase the allowance of the Medical Department by 1 per cent, which would permit the Medical Department to have enlisted force of not to exceed 6 per cent (it is now 5 per cent) of the total enlisted strength of the permanent Army, and to provide further that 1 per cent of this personnel may be detailed for strictly veterinary duties.

APPRECIATION OF SERVICES

THE following letter addressed to Capt. Lester R. Smith, V. C., commanding officer of the IV Corps Mobile Veterinary Hospital, on the eve of his departure from Germany for the States, is self-explanatory. It has been stated that the success of this Mobile Veterinary Hospital was made possible by the close cooperation and assistance of Major W. Reid Blair, Corps Veterinarian of the IV Army Corps.

A. E. F., GERMANY, May 11, 1919.

To CAPTAIN LESTER R. SMITH, V. C.:

1. The IV Army Corps Mobile Veterinary Hospital having been relieved from duty with the IV Corps, the Commanding General takes this opportunity to express his appreciation to the commanding officer and the men of that unit for their loyal and conscientious service throughout the period of hostilities and since the signing of the armistice. The IV Army Corps Mobile Veterinary Hospital joined the IV Army Corps on the 14th day of August, 1918, and since that time has toiled with untiring energy to care for and improve the condition of the horses in this Corps.

2. This unit has always maintained a high standard of efficiency. The conduct of its personnel has been exemplary.

(Signed) C. P. SUMMERALL,
Major General, U. S. Army.

COMMUNICATION

TO THE EDITOR:

Every member of the A. V. M. A. should make a special effort to secure the passage of that part of the Senate plan of reorganization of the Army that gives to the Veterinary Corps the rank of Colonel and Lieutenant Colonel, providing that these places shall be filled by veterinarians and not cavalry officers or medical men.

The questions of the size of the Veterinary Corps, its personnel and the percentages of higher rank as well as universal military training are all questions for each member to determine for himself individually.

All these latter as well as military veterinary school involve the question of a permanent peace and the onerous taxation of all the people, rich and poor, and every thinking man will determine his stand upon these problems according to his convictions.

Let us be a unit as to the need of sufficient rank for the Corps to function properly with all other technical branches of the army service.

W. HORACE HOSKINS.

A recent report from the Philippines indicates that a general outbreak of surra is prevailing among the horses of the War Department and that a fresh infection of glanders is causing further anxiety to the official veterinarians.

ASSOCIATION NEWS

Proceedings of the Fifty-Sixth Annual Meeting of the American Veterinary Medical Association

Held at the Hotel Grunewald, New Orleans, La.,
November 17 to 22, 1919

MONDAY MORNING, NOVEMBER 17, 1919

The meeting was called to order by President V. A. Moore, at 10:30 a. m.

THE PRESIDENT: The time has come when the Fifty-Sixth Annual Convention of this Association shall come to order. We are very glad to be in this beautiful city and to receive the words of welcome from its most honored representatives. We are very sorry to announce that the Governor of the State has been called by other business so that he can not be present, but he has asked Dr. Dalrymple to represent him on this occasion. I have great pleasure in introducing Dr. Dalrymple. (Applause.)

DR. W. H. DALRYMPLE (Baton Rouge, La.): Mr. President, Honored Guests, Members of the American Veterinary Medical Association: The Governor had accepted the invitation to be present on this occasion, but usually the Governor of the State is a very, very busy man, and he does not know when he will be called away. In a letter here he states his regrets at not being able to attend the American Veterinary Medical Association meeting. When I got this letter I called the Governor up and told him that it wouldn't do for me to address a welcome, that I was one of the people that he was supposed to welcome rather than that I welcome the people. However, I want to say, not to make a speech, that I am extending the Governor's hearty welcome to the Association to New Orleans.

I may express my own personal pleasure in seeing that I am having my own wishes gratified, after twenty years of invitation. I think I have invited the Association every year for twenty-five years, and now it is here. We have a good representation, and I can assure you that I feel very much gratified at the occasion. I also want to assure you that the Governor is very much interested in our work and is very sorry that he couldn't be with us today. (Applause.)

THE PRESIDENT: I think that we are all very glad that Dr. Dalrymple's wishes have been gratified and that we are here.

I now have the pleasure of introducing the Mayor of New Orleans, who is to give us a few words of welcome. (Applause.)

MAYOR'S ADDRESS OF WELCOME

MAYOR MARTIN BEHRMAN (New Orleans): Mr. Chairman, Gentlemen of the American Veterinary Medical Association, and Ladies:

I don't suppose it is necessary for me to say to the delegates who attended the convention in New York a few years ago that I am glad you are here, because I traveled to New York and invited you to come here. Of course something happened that kept you from coming up to this time, but we American people had something to do that kept you from coming here at that time. I think the people of this country have made a very good job of it, and we are glad it is finished, so that you had the opportunity to come to New Orleans.

You know no man's life is complete until he has come to New Orleans. (Applause.) I know everywhere that I go—and I have traveled considerably and I meet a great many people—they all express a sinister desire to come to New Orleans. I haven't traveled much since the first of July, and I don't know if that applies to the same extent that it did prior to the first of July. (Applause.)

Of course, a wonderful change has taken place for those who have lived here all of our lives, and we have lived here a long time. The city is 201 years old and those sudden changes have shocked some of us, but we are getting accustomed to it, and we are not going to miss it. We have a wonderful supply (Laughter and applause)—not what you think (Laughter)—water. The great Mississippi River flows by our doors, gives us an unlimited water supply, and through our wonderful filtration plant we furnish that wonderful water to all of the homes, all of the institutions, purer, at a cheaper price, than any city in the country. So don't be afraid to drink the New Orleans water—and we want you to drink water—(Laughter) because there is an old adage—I will tell it to you in French: "Si vous buvez une fois de la Mississippi, le désir vous fera y retourner." It means, in the language that we talk, "Once you drink of the Mississippi water, you shall always return."

So, in the days that have gone by, that date back of July, we used to say to people that came to New Orleans that we insist that you at least drink one glass of water while you are in New Orleans, because we are impressed with the truth of that adage and we know that once you drink of that water you will return, and we want you to come again.

We want you to come to a city that has made history for this country. You know, gentlemen of the Association, that the successful fights against pestilence and floods were made here, and we are proud of the record made in those various fights. There was some time perhaps in the long ago that we would not have asked you to New Orleans. We were not ready to receive you. We did not want strangers in large numbers to come around and see what we had. Of course our people in the South had suffered a great deal here. We suffered from the war between the States, and the reconstruction days that came after that war. We suffered from pestilence and flood. We put them in the background and now they are behind us. We have built up magnificent systems of drainage. We are ready and glad to have conventions, such as we see here

this morning, to come to New Orleans. We know that every convention that comes brings the picked men of the country, and for that reason we are glad to have conventions come to New Orleans, look us over, see what we are doing, see what we are going to do presently, and learn what our hopes and aspirations are.

We have a magnificent city. We have 196 $\frac{1}{4}$ square miles within its limits. We have plenty of room to bring those who feel they are not doing as well where they live down to New Orleans and take advantage of the things that the good God Almighty has given us.

I am glad that you brought so many ladies here with you. I surmise that they are most intelligent ladies, that they are most thoughtful ladies, because they accompanied their husbands to New Orleans. (Laughter.) You know New Orleans has the reputation of having the handsomest women in this country, but when I go and visit other cities I see the same kind. Of course you know about the South's chivalry to women, and the reputation is deserved.

Now, dear ladies, you will find much here to interest you. This is one of the old cities of the country. You go to the average big city and you see the same thing. You see the tall buildings, the fast-moving trains, electric cars, and so on. Here you come to a city just a little different from the others. Canal Street, a wide street, divides the old town from the new. Down below Canal Street you will see scenes that will remind you of Spain and France, but on Canal Street you will see the up-to-date, hustling American city. That street is full of history and romance, and we are going to maintain it for all time to come. Glorious pages of history are written with the deeds performed that brought about and maintained that section.

The men are interested in knowing what this great community is doing. We have here the most magnificent harbor in the country. We are the second port in the United States as to imports and exports. We are, however, the first port as to efficiency. This sounds like egotism, but every word that I am telling, ladies and gentlemen of the convention, you will see borne out before you leave here. The city and State combined own the terminals. The State owns all the docks and great warehouses, but connecting all those is a railroad owned by the City of New Orleans. These public utilities are not built for the purpose of making money for the stockholders. They are built to render efficient service, to encourage coming to the port. So far as a port town is concerned, it is all public ownership, in the hands of the people, operated for them, by them, in the interest of those who want to use them.

The public school system here is unexcelled. There are 87 magnificent temples dedicated to the cause of public education. We have two great universities, great medical schools, and we are doing everything we can to encourage those who live here to stay here and to bring those who are looking for a better place to come to.

Let me say to the gentlemen of your Association that we are interested in the work that you are doing. It so often happens that those

of us who live in the great cities pay very little attention to the work that men of your profession do; but here in New Orleans—and I believe that those in your profession will vouch for it—we are interested. We want to assist, and we do assist, in the legislation to do what is necessary for your profession. One branch of your profession that engaged in the eradication of the tick had every representative in the House and Senate for them. That made tick eradication possible. We are interested in your work. (Applause.)

You know the great good that comes from these conventions; men of the same profession coming from different parts of the country, intermingling, exchanging views and ideas, imparting knowledge from one who has acquired it to those who have not.

I am glad to see that so many busy men can come to a convention. I am reminded of the story of the busy man. He was apologizing to the convention that there were so few men from his own city there. They were too busy attending to their own business to attend to the business of the country. I told them that it reminded me of an Italian who came before Judge Foster of the Naturalization Court for naturalization.

The Judge said, "Tony, who is the President of the United States?"

"Mr. Wils'."

"Fine! Who is the Vice-President?"

"Mr. Marsh'."

"Why, that is fine, Tony!"

It was a little abbreviated, but he knew.

"Now, Tony, could you be President of the United States?"

"Me, Mr. Judge? Oh, no. I'm too busy with my banana stand."
(Laughter.)

That is the great trouble in all branches of business today. Some men are too busy at home to help mold an opinion by getting together with his own brothers in his line.

I am glad you have come. I hope that the sessions and clinics of your convention will be successful. I hope when you return home you will have nothing but pleasant recollections of your visit to New Orleans. (Applause.)

THE PRESIDENT: In addition to the Mayor, we have a word of welcome from Dr. Oscar Dowling, President of the Louisiana State Board of Health. (Applause.)

WELCOME BY DR. DOWLING

DR. OSCAR DOWLING: Ladies and Gentlemen, the Mayor may have aroused your hopes, may have increased the flow of gastric juice and possibly caused your heart to leap with joy, but I want to assure you that there is an ample supply of Mississippi cocktails and you can get them at any soda water stand.

It is a stereotyped expression with us to say that we are glad to see you. We are always interested in the preservation of health. When I first undertook the work, my initial invitation was sent to interest the women. I wrote a letter and quoted this:

"They talk about a women's sphere as though it had a limit.

There's not a single joy or woe,

There's not a whispered yes or no,

There's not a life nor death nor birth,

There's not a thimbleful of mirth,

Without a woman in it." (Applause.)

I felt that if we could get the help of the women, it would be a great thing.

My next request went to the Bureau of Animal Industry, who assigned a man who went with us on the health train when we began operating in 1910. This splendid representative from the Bureau of Animal Industry explained to the people the need of the tuberculin test, and he began the test. A thing of that kind had been unheard of by our people. Since then we have had associated with us Dr. Tuck, who has done excellent work, and has wrought miracles in getting people to have their cows tested for tuberculosis. He has had the cooperation of the members of your Association throughout this test.

I need not say how glad we are to welcome you this morning. New Orleans and her citizens are pleased always to have within her gates men who, like you, are attempting to apply the principles of science. More particularly are we glad to have those whose purpose is the amelioration of suffering and the prevention of those conditions which are a menace to the health and well-being, therefore the prosperity and happiness, of the people.

I have been associated for years with a number of your co-workers, among them Doctor Dalrymple of the University, of Baton Rouge. He has been my good friend on many occasions and from him and others I know something of the achievements, scope, purposes and outlook of your Association. It goes without saying that a State Health Officer—in fact all medical men—fully appreciate and are in complete accord with the actual work daily accomplished.

The growing importance of the relation between the science of diseases of animals and the science of diseases of men is clearly apparent. They are correlatives—each a help to the other. Every step made by you toward a better understanding of the cause of animal disease, every step which means prevention of the spread of many of these means progress in the control of some human maladies and a lessening of the sum total of human disability and suffering.

In 1916 there were 4 cases of anthrax; in 1917, 27 cases; 1918, 13; and 1919 to November 1, 3 cases, a total of 47. During these four years to June 1, 1919, there were 9 deaths. The spread of the infection can be traced unmistakably to ignorance. For the illumination of those most concerned you, as medical veterinarians and medical men, *per se*, are responsible. If in the coming year we could make this clear—make it so well known that there would not be a case of human anthrax, it would be indeed an achievement

worthy of our joint effort. I shall not take your time to give further illustrations—they are better known to you than to me.

This thought leads to an expression of what is in all our hearts. A few months ago no man dreamed that there could develop a union of action by the great nations of the world for what seems—even now to some—a vague ideal. That sane, sensible, intelligent men of affairs would believe it possible, even practicable, to unite for a federation based on democratic principles—justice, equity and self-expression for all—seems utopian to a degree. Yet it was done; it is accomplished, if not wholly, in such part as to justify the hope in the hearts of millions.

We have learned—at a tremendous cost—the working possibilities of a coordination of forces and a unity of purpose. Along all lines this is a dominant thought and all organized social agencies which have the vision are making concrete in action the lesson of the twentieth century.

Again, personally and as State Health Officer, I congratulate you upon the ideal of your Association and the intelligent grasp of the present in its relation to the future which is evidenced by your program for this meeting, your plans for the future and the scientific purpose which is the basis of your effort.

If tired of or disappointed in your present home, come to Louisiana, the home of the orange blossom and the mocking bird, where people drink coffee eight times a day and women never decay.

THE PRESIDENT: We are disappointed that Dr. Adams is not able to be with us this morning to respond to these eloquent addresses of welcome. In his place Dr. David S. White of Columbus, Ohio, has consented to perform this duty.

RESPONSE BY DR. WHITE

DR. WHITE: Mr. Chairman, Honorable Mayor, Secretary and Members of the American Veterinary Medical Association: I share in the disappointment of the chairman.

When I arrived here at 2 o'clock last night, I didn't know that I would be standing before you this morning, making an effort to address you in response to the orations of welcome that you have just heard; but in my two years in the Army I learned to be a good soldier, and when my commander-in-chief ordered this thing done I felt of necessity that it must be done to the best of my ability.

I feel somewhat like a friend of mine who was a well-known public speaker and usually had at hand a ready word. He was invited to address the prisoners in chapel at the Ohio Penitentiary, and when he faced this immense audience of 2,000 people, he was awe-stricken.

"Gentlemen," he said, "I am glad to see so many of you here." (Laughter.)

I am glad that so many of you have completed your lives as I have completed my life by coming to New Orleans.

I am glad to see our venerable colleague, Dr. Dalrymple, repre-

sending the Governor of the State (applause), and I hope, Ladies and Gentlemen, that when I return to New Orleans I will find him, not representing the Governor of the State, but the Governor of the State himself. (Applause.)

If you will pardon the personal allusion, Mr. Mayor, while I am a Northerner—really a New Yorker, as I understand you are, Sir—there is an affection, a personal affection, for New Orleans. My father was a native of this city, and he laid out Pass Christian, which, as I understand, is an important suburb of New Orleans. One wing of my family lives here. I am going around to see that wing while I am here, and maybe I will get a wing. I hope I won't get a neck. (Laughter.)

I thought perhaps the Mayor, in extending to us the key of the city, would extend to us the key of the cellar. (Laughter.) I notice he didn't do that, and then I happened to think you don't have any cellars in New Orleans. Where do you keep it? (Laughter and applause.)

I don't believe anybody's life, even though he may have come to New Orleans, is entirely complete until he has partaken of that very seductive, oleaginous compound or emulsion that they call a "gin rickey," and having no cellars and the garrets not being accessible to the stranger, I am afraid we are a little up against it, and we will have to take the Frenchman's advice and drink of the great waters of the Mississippi, which I understand have been purified and sanctified for this special occasion.

I only need to tell the representatives of the Queen City and of the State of Louisiana how we appreciate the hearty southern welcome that we have received at their hands.

The veterinary profession, like the professions of medicine and law, has had a struggle for its existence. We were a new thing in a new country twenty-five years ago, and a convention such as this would not have been possible. The profession is attracting to it continuously a better type of manhood, and is fast taking its place alongside of the other professions with which we are more familiar.

We have several factors contributing toward this end, only one of which I shall mention, and that is, the American Veterinary Medical Association. We meet here or elsewhere once a year. We get together and exchange experiences. There are certain social features connected with our meetings, and wherever we have gone in the past I think we have left behind us good impressions; at least I was told in one city where this Association had held its meeting that most of the folks thought it was a convention of Presbyterian preachers. I tell this to your Honor, so that you will not feel alarmed while we are in the city.

Having given ourselves a splendid reputation (laughter), I will say in closing that we will accept and use this hospitality and will in no way abuse it. Thank you. (Applause.)

THE PRESIDENT: I have not been so fortunate as Dr. White, because I have had a long time to think about this, and a great many

subjects to choose from, and consequently I feel that he is now to be congratulated that his troubles are over and mine are to begin.

(President Moore then read his address. It was published in THE JOURNAL for December, 1919.)

THE PRESIDENT: The next item of business is the presentation and adoption of the minutes of the last meeting.

THE SECRETARY: Mr. President, I present the minutes as published in the special issue of THE JOURNAL for January, 1919. I move that they be approved, dispensing with the reading of them. (The motion was seconded and carried.)

Adjournment.

MONDAY AFTERNOON

The meeting was called to order at 2:00 p. m., President V. A. Moore presiding.

THE PRESIDENT: The first order of business this afternoon will be the report of the Executive Board.

REPORT OF EXECUTIVE BOARD

DR. N. S. MAYO (Chicago): I will take up the printed list of applications, beginning with Alabama. We have checked the names of J. H. Beckham and John Redmond.

DR. A. T. KINSLEY (Kansas City, Mo.): Mr. President, I move that the rules be suspended and these men in Alabama, except the two mentioned, be elected by acclamation.

(The motion was seconded and carried.)

DR. MAYO: Next take Arkansas. All of the three applicants have been recommended for membership.

DR. KINSLEY: Mr. President, I move you the approval in the same motion as before.

(The motion was seconded and carried.)

DR. MAYO: Next we have Arizona. All except J. C. McGrath.

DR. KINSLEY: I move you the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: Next take California. All except W. J. Lembke were recommended for membership.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All in Colorado were recommended with the exception of Charles C. Stewart.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: In the District of Columbia all have been recommended for membership except two, O. H. Basseches and Paul J. Schwarz, and they are rejected.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The two applicants from Florida have been recommended.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: In Georgia all have been recommended for membership with the exception of C. J. Miller.

DR. KINSLEY: He comes under the suspension of rules. I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All in Idaho and Illinois have been recommended for membership.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All in Indiana with the exception of Charles J. Gruber and C. C. Winegardner have been recommended.

DR. KINSLEY: I move the recommendation be approved with the exception of the last name on the list, F. E. Wyant.

(The motion was seconded and carried.)

DR. MAYO: I move that all be elected except Charles J. Gruber and Winegardner, and F. E. Wyant, who was laid over for further information.

(The motion was seconded and carried.)

DR. MAYO: In Iowa, I. A. Anderson has been laid over for further information. All the others are recommended for election.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Kansas have been recommended for membership by the Executive Board.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All the applicants in Kentucky have been recommended for membership.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from Louisiana, Maine, Maryland and Massachusetts have been recommended for membership by the Executive Board.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Michigan with the exception of E. H. Fletcher, whose application has been laid over for further investigation, have been recommended for membership.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Minnesota with the exception of the first one, C. H. Aamoth, and Ira M. Ford, who have been laid on the table for further investigation, were recommended for membership.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: I wish to state that if any of you have any informa-

tion detrimental to any of these names who are proposed you ought to make it known.

All applicants from Mississippi, Missouri and Montana have been recommended for membership by the Executive Board.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All applicants from Nebraska, with the exception of R. F. Lovell, have been approved, and his name has been laid over for further recommendation.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All applicants from New Hampshire and New Jersey have been recommended for membership.

DR. LOWE: In regard to New Jersey, I move you, sir, the election of the men whose names have been favorably recommended.

(The motion was seconded and carried.)

DR. KINSLEY: I move the approval of two applicants from New Hampshire.

(The motion was seconded and carried.)

DR. MAYO: All applicants from New York, excepting W. J. Chynoweth, have been recommended for admission and it is recommended that Dr. Chynoweth's name come under the suspension of the rules.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The applicants from North Carolina have been recommended for admission with the exception of Dr. Flowers and Dr. C. A. Greenig. They are laid over for further information.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. KINSLEY: To be fair to North Carolina, it should be explained that the two names mentioned were short on vouchers.

DR. MAYO: Last year it was the desire of the Association in the case of applicants who were vouched for by army officers and whose applications came in from army camps to get a voucher from applicant's home State, and so far we have not been able to find anyone from North Carolina to vouch for these two men and they have been laid over for that information. Others were in the same shape, but additional vouchers have been secured and I have the names here if you want them.

All the applicants from North Dakota have been approved. Dr. H. P. Roberts was recommended by Dr. White, Dr. Moore and Dr. Mayo.

DR. KINSLEY: I move they be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from Ohio have been recommended with the exception of R. J. Gutermuth of Pittsburg, who was laid over for further information.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: In Oklahoma two applicants, Lewis and Rader, have been recommended, and McElroy is to come under suspension of rules.

DR. KINSLEY: I move approval.

(The motion was seconded and carried.)

DR. MAYO: All the applications from Oregon have been approved and recommended for admission.

DR. KINSLEY: I move they be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from Pennsylvania have been recommended for membership. Dr. Marshall has vouched for Dr. Hutchins and Dr. Martin.

DR. KINSLEY: I move they be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from South Carolina except S. A. Richardson have been recommended for admission to membership.

DR. KINSLEY: What is the recommendation on him?

DR. MAYO: We recommend that he be rejected.

DR. KINSLEY: I move the recommendations be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Washington have been recommended for admission to membership in this Association.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The applicants from West Virginia and Wisconsin have been recommended for membership. Dr. Fletcher, Dr. Hart and Dr. Knapstein have been vouched for by Dr. Eliason in addition to those here.

DR. KINSLEY: I move the approval of the recommendation.

(The motion was seconded and carried.)

DR. MAYO: All from Wyoming, Alaska and Canada have been recommended with the exception of Dr. Ungar of Canada, and it is recommended that he be elected under suspension of rules.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: All the applicants from the Philippine Islands and an applicant each from London and France have been recommended for admission.

DR. KINSLEY: I move the recommendation be approved.

(The motion was seconded and carried.)

DR. MAYO: The 1919 men will have to be admitted under a suspension of the rules, and they have been recommended by the Executive Board. They are on the first page, Beckham and Redmond; Chynoweth under New York, C. J. Miller from Georgia, McElroy from Oklahoma, Ungar from Canada, and Dr. Bray and Dr. Hamner.

(It was moved and seconded that these men who graduated in 1919 be elected under the suspension of the rules. The motion was carried.)

DR. MAYO: The following applications that came in too late to be included in the regular list have been acted upon by the Executive Board.

(Dr. Mayo read the list.)

DR. MAYO: The Executive Board has recommended that all of these with the exception of W. S. Dodge and T. W. Atkinson be accepted.

(It was moved that the recommendation be approved, and the motion was seconded and carried.)

DR. KINSLEY: Mr. President, if it is in order, I should like to move a reconsideration of the vote on the Ohio list.

(The motion was seconded by Dr. Bennett and carried.)

DR. KINSLEY: Mr. President, I move you the list as recommended be accepted with the exception of A. C. Dunlap in addition to Gutermuth.

DR. BAKER: In regard to Dunlap, concerning his affiliations and graduation from the Western, we have members elected who are graduates of that school, who are properly vouched for. Considering that Western is a defunct school, I would like to recommend that if he can be properly vouched for by people who know him he be accepted on his personality.

COL. L. A. MERILLAT: I move that this matter be laid over until Dr. Planter, who is here at the meeting, is consulted. I move to amend the motion.

DR. MAYO: It would seem to me it would be better to refer these two names back to the Executive Board and approve the rest of them.

COL. MERILLAT: I am willing to withdraw my motion.

THE PRESIDENT: The question is that these names from Ohio be voted upon, including the one laid over before and excluding the name of Dr. Dunlap.

(It was moved, seconded and carried that all of the candidates from Ohio, with the exception of the three, Alspach, Dunlap and Gutermuth, be elected.)

DR. MAYO: I have another matter to present. Charges have been preferred against a member, Dr. W. D. James of Martinsville, Ill., and the Executive Board recommends that he be expelled from the Association.

DR. KINSLEY: I move that the recommendation be approved.

(The motion was seconded.)

DR. HOSKINS: I would like to ask what are the charges?

(Dr. Mayo read the charges.)

(The motion was carried.)

THE PRESIDENT: That completes the business as recommended by the Executive Board up to this time. The next order will be the report of the Secretary.

(The Secretary read his report, which follows.)

REPORT OF THE SECRETARY

The past year has been a prosperous one for this Association, although there has been an extensive movement of members, due largely to demobilization of army forces. There has also been a very marked development of local and State veterinary associations. Many new associations have been organized and those already established have had an increased attendance. There has also been a decided increase in public interest in the whole field of veterinary science and particularly along educational lines.

The year has been a busy one for the Secretary's office. On taking over the office it was necessary to arrange and systematize the work. In addition to this the membership was increased nearly 40 per cent by the addition of over 1,000 new members. For these, ledger records had to be made. The frequent changes of addresses of members, particularly those in the army service, has also added to the work. All changes of addresses have been made on the Secretary's records and a notice has also been promptly sent to the Editor of THE JOURNAL of the Association. In addition to the alphabetical ledger index of Association members, a card index of members by States has been made. This was necessary in order to take postal-card votes. On account of a rearrangement of districts it was necessary to take a postal-card vote for nomination and election of members of the Executive Board for Districts Nos. 2 and 3. Dr. T. E. Munce was elected in District No. 2 and Dr. S. E. Bennett in District No. 3.

There are at present 3,470 active members of this Association. During the past year 153 members have been dropped for non-payment of dues. It is probable that a number of these will be reinstated. Sixteen members have been reinstated and 16 have tendered their resignations. During the year 48 members have died. The number of new applications for membership is 792.

While the work of the Secretary's office has increased, I am pleased to report that the expense has been less than for several previous years. This is largely due to the availability of the equipment of a large business office that has been utilized without cost to the Association. The expenses of the Secretary's office other than the Secretary's salary may be classified as follows:

Clerical help	\$582.21
Printing and stationery.....	375.20
Postage	433.17
Traveling expenses	73.71
Miscellaneous	165.55

More than 20,000 pieces of first-class mail have been sent out from the Secretary's office.

A change was made in the method of handling the money received by the Secretary. Formerly it was the practice to forward all checks, drafts, money orders and cash to the Treasurer every month. In many instances, particularly among the army veterinary officers who

were moving frequently, bank accounts had been closed and checks were returned unpaid, causing increased work to the Secretary's and the Treasurer's offices. Now all funds are deposited immediately by the Secretary in a local bank for collection and a remittance is made to the Treasurer every month. From September 1, 1918, to November 1, 1919, the Secretary has received from all sources and sent to the Treasurer \$27,592.48. Of this amount \$3,713.45 was collected and entered by the former Acting Secretary. The balance amounting to \$23,579.03, mostly in remittances of \$5 and \$10, was handled by the present Secretary.

Vouchers to the total amount of \$14,559.86 have been drawn on the Treasurer. Of this amount \$2,500 was sent to Prof. Vallée from the Veterinary Relief Fund, and \$500 from the same fund was placed at the disposal of the Veterinary Relief Committee. One voucher for \$293.04 was for funds belonging to the Salmon Memorial Fund that had been deposited with the Treasurer of the A. V. M. A. by mistake. The sum of \$5,873.76 was invested in United States and Canadian Government bonds, and a revolving fund of \$200 for the Secretary's office is to be returned. Subtracting these items, the net expense of the Association for the 14 months is \$5,486.10, the net receipts from the Secretary's office being \$22,399.39. This does not include the JOURNAL funds of the Association.

The Secretary has had an opportunity of attending quite a large number of veterinary association meetings without expense to the Association, and in all cases the advantage of joining the A. V. M. A. and advancing the interests of the profession has been presented with good results. One trip to the meeting of the Southeastern Veterinary Association was at the request of President Moore, and with the approval of the Executive Board was made at the expense of the A. V. M. A.

The importance of having an official representative of the A. V. M. A. attend veterinary meetings has been presented to this Association previously. This Association should use every means to encourage and stimulate the organization and development of State and local veterinary associations, for it is largely through these that progress in all lines can be best obtained. Many of the smaller associations need such assistance and this offers an excellent field for constructive work by this Association.

At present there is no official connection between the A. V. M. A. and State or local associations. It would seem that a method could be devised by means of which some official connection could be established that would be mutually helpful and increase the efficiency of both for the advancement of the interests of the profession as a whole. I would recommend that a special committee be appointed to consider this subject and report at the next meeting of the Association.

A question has been raised by members of this Association who are practitioners regarding Section 7 of the Code of Ethics that

prohibits members for contracting with live-stock insurance companies for the treatment of live stock insured by them. This class of veterinary work is becoming important in some sections of the country and it is claimed that a member of this Association is placed at a disadvantage. The subject should be given your careful consideration.

Dr. J. V. Newton of Ohio has suggested the adoption of an official emblem for the A. V. M. A. that may be used on stationery of members who are in good standing, the printed stationery to be supplied by the Secretary's office at cost. This idea appears to be an excellent one. Some members are unwittingly using illustrated stationery and bill heads of doubtful propriety. The adoption of a neat Association emblem would do much to establish an ethical standard in this line. Such an emblem might also be used as a pin. I recommend that this be considered by the Association.

There were over 2,100 veterinarians in the army service, a large majority of whom were members of the A. V. M. A. The military record of every member of this Association should be sent to the Secretary's office so that it can be entered as part of the permanent records of this Association. This is important and the value will increase as time passes.

There are a number of minor changes that should be made in the Constitution and By-Laws of this Association to make them better adapted to the needs of the Association, and I would recommend that a committee be appointed for this purpose.

A well-organized effort is being made through State legislatures to secure the passage of laws that will prohibit veterinarians as well as physicians from dispensing medicines. This is a matter of much importance, particularly to veterinarians with a country practice, and I would urge this Association through the Legislative Committee to watch carefully for State legislation that is inimical to the interests of the veterinary practitioner.

I wish to express my thanks for the cordial assistance of the officers, Editor of THE JOURNAL, committee members and resident secretaries. The chairmen and secretaries for the sections on Practice and Sanitary Science and Police have arranged for most of the excellent program that is offered at this meeting. I also want to acknowledge the efficient services of my secretary, Miss Apeland, who has looked after all the details of the Secretary's office and handled all the funds. The books have been neatly and accurately kept.

Respectfully submitted,

N. S. MAYO, *Secretary.*

THE PRESIDENT: You have heard the report of the Secretary. I think it is customary that this should be referred to the Executive Board.

DR. KINSLEY: I move that we receive the report of the Secretary.

DR. HOSKINS: As Treasurer of the Auxiliary League Fund, I would like to make some corrections there. That motion was that

\$500 be put in the hands of Dr. Smith, so he wouldn't have to go down into his personal funds for expenses.

DR. MAYO: It was placed at his disposal.

DR. HOSKINS: That was the Veterinary Relief Organization.

(Dr. Kinsley's motion was put and carried.)

REPORT OF THE TREASURER

THE PRESIDENT: The next item is the report of the Treasurer, Dr. Jacob.

DR. JACOB: The Treasurer's report has been prepared in pamphlet form and I presume is in the hands of most of you and is self-explanatory.

(The Treasurer's report follows.)

Receipts from September 7, 1918, to November 4, 1919

1918			
Sept.	7	From F. H. Schneider, A. V. M. A. Fund.....	\$ 6,051 08
Sept.	7	From F. H. Schneider, Journal Fund.....	5,611 61
Sept.	7	From F. H. Schneider, Relief Fund.....	5,176 94
Sept.	11	From N. S. Mayo, Secretary, A. V. M. A. and Journal Fund.....	938 15
Sept.	11	From N. S. Mayo, Secretary, A. V. M. A. and Journal Fund.....	1,490 00
Sept.	11	From N. S. Mayo, Secretary, A. V. M. A. and Journal Fund.....	1,285 30
Sept.	11	From P. A. Fish, Journal.....	405 63
Sept.	11	From T. E. Smith, Relief Fund.....	235 00
Sept.	21	From N. S. Mayo, A. V. M. A. and Journal Fund..	1,247 00
Sept.	21	From N. S. Mayo, A. V. M. A. and Journal Fund..	5 00
Nov.	1	From N. S. Mayo, Corrected Checks and Money Orders.....	25 00
Nov.	15	From W. H. Dalrymple, Journal Fund.....	67 91
Nov.	18	From N. S. Mayo, A. V. M. A. and Journal Fund..	1,493 47
Oct.	18	From N. S. Mayo, A. V. M. A. and Journal Fund..	1,358 25
Nov.	30	From T. E. Smith, Relief Fund.....	100 00
Dec.	18	From N. S. Mayo, A. V. M. A. and Journal Fund..	602 45
Dec.	18	From W. H. Dalrymple, Journal Fund.....	101 78
Dec.	31	From T. E. Smith, Relief Fund.....	75 00
1919			
Jan.	6	From City National Bank, interest on \$7,000 for 60 days.....	70 00
Jan.	18	From N. S. Mayo, A. V. M. A. and Journal Fund..	3,204 57
Feb.	4	From W. H. Dalrymple, Journal Fund.....	754 88
Feb.	4	From T. E. Smith, Relief Fund.....	29 00
Feb.	18	From N. S. Mayo, A. V. M. A. and Journal Fund..	1,620 78
Feb.	18	From C. E. Hayden, Salmon Memorial Fund.....	268 01
March	5	From W. H. Dalrymple, Journal Fund.....	314 44
March	17	From N. S. Mayo, A. V. M. A. and Journal Fund..	229 00
March	17	From S. H. Gage, Salmon Memorial Fund.....	25 00
April	5	From W. H. Dalrymple, Journal Fund.....	314 33
April	17	From N. S. Mayo, A. V. M. A. and Journal Fund..	700 50
May	3	From W. H. Dalrymple, Journal Fund.....	1,366 10
May	20	From N. S. Mayo, A. V. M. A. and Journal Fund..	706 90
June	10	From City National Bank, interest on \$7,000 Journal Fund.....	186 69
June	21	From W. H. Dalrymple, Journal Fund.....	602 67
June	22	From N. S. Mayo, A. V. M. A. and Journal Fund..	620 16
July	19	From T. E. Smith, Relief Fund.....	50 00

July	4	From N. S. Mayo, A. V. M. A. and Journal Fund.	289 50
Aug.	20	From W. H. Dalrymple, Journal Fund.	733 67
Aug.	22	From N. S. Mayo, A. V. M. A. and Journal Fund.	466 50
Sept.	18	From N. S. Mayo, A. V. M. A. and Journal Fund.	692 00
Oct.	18	From N. S. Mayo, A. V. M. A. and Journal Fund.	6,890 35
Oct.	20	From City National Bank, interest on \$1,000 Relief Fund.	40 00
Nov.	1	From Dividends on Dominion of Canada Bonds.	150 00
Nov.	1	From Dividends on U. S. Government Bonds.	102 90
Total Receipts.			\$ 46,697 52
Less checks deposited but returned uncollected.			52 00
Net Receipts.			\$ 46,645 52
Total Expenditures.			29,485 50
Balance cash on hand.			\$ 17,160 02
Dominion of Canada Bonds on hand			\$ 3,023 20*
U. S. Liberty Bonds on hand.			\$ 2,850 00* 5,873 20
Total.			\$ 23,033 22
*Purchase price.			

RECAPITULATION

<i>Journal Fund</i>			
Receipts.		\$ 22,366 15	
Expenditures.		17,257 22	
Balance.		\$ 5,108 93	
Liberty Bonds.		2,850 00	
			\$ 7,958 93
<i>Association Fund</i>			
Receipts.		\$ 18,573 43	
Expenditures.		9,225 82	
Balance.		\$ 9,347 61	
Canada Bonds.		3,023 20	
			\$ 12,370 81
<i>Relief Fund</i>			
Receipts.		\$ 5,705 94	
Expenditures.		3,002 46	
Balance.		\$ 2,703 48	
Total balance cash and bonds on hand.			\$ 23,033 22

EXPENDITURES

<i>Association Fund</i>			
1918			
Sept.	21	American Surety Co. of N. Y., premium on bond for N. S. Mayo as Secretary.	\$ 12 50
Sept.	21	H. Preston Hoskins, expenses as Secretary of the Section on Sanitary Science and Police.	6 25
Sept.	21	P. A. Fish, salary for August, 1918.	125 00
Sept.	21	Jas. G. Jervis, expenses as Provincial Secretary for B. C., during 1917 and 1918.	1 81
Sept.	21	A. S. Cooley, expenses as Ohio State Secretary.	5 00

Sept.	21	The Ravenswood Press, printing stationery.....	63 75
Sept.	21	P. A. Fish, office assistant for August.....	60 00
Sept.	21	F. H. Schneider, one-half of office expenses.....	20 83
Sept.	21	Julian Grayson, auditing Secretary's accounts.....	30 00
Sept.	21	F. Torrance, expenses President's office, 1917-1918.....	28 74
Sept.	21	Milton J. Ernest, refund of application fee.....	10 00
Sept.	21	Percy Graham, refund of application fee.....	10 00
Sept.	21	W. P. Kely, refund of application fee.....	10 00
Sept.	21	T. W. Stewart, refund of application fee.....	10 00
Sept.	21	Wm. B. Casilear, refund of application fee.....	10 00
Sept.	21	Claude E. Thompson, refund of application fee.....	10 00
Sept.	21	Jos. C. Mitchell, refund of application fee.....	10 00
Sept.	21	J. F. Kagey, refund of application fee.....	10 00
Sept.	21	Thos. J. Ahern, refund of application fee.....	10 00
Sept.	21	H. M. Clarvoe, refund of application fee.....	10 00
Sept.	21	Wm. G. Saunders, refund of application fee.....	10 00
Sept.	21	Adrain A. Martin, refund of application fee.....	10 00
Sept.	21	Danl. W. McCallum, refund of application fee.....	10 00
Sept.	21	E. B. Simonds, refund of application fee.....	10 00
Sept.	21	E. V. Fenton, refund of application fee.....	10 00
Sept.	21	Robt. P. Huffman, refund of application fee.....	10 00
Sept.	21	M. V. Wilmot, refund of application fee.....	10 00
Sept.	21	L. Enos Day, expenses of Secretary's office, August.....	447 10
Sept.	21	Wm. A. Carter, refund of application fee.....	10 00
Oct.	14	The Ravenswood Press, letterheads and envelopes.....	7 45
Oct.	14	N. S. Mayo, salary as Secretary for September, 1918.....	100 00
Oct.	14	The Ravenswood Press, printing postal cards.....	9 85
Oct.	14	The Workman Mfg. Co., printing.....	22 25
Oct.	14	W. H. Martin, transcript of proceedings of 55th annual meeting of A. V. M. A. and incidental expenses.....	165 00
Oct.	14	N. S. Mayo, expenses of Secretary's office for September.....	194 96
Oct.	14	H. E. Hosbach, auditing books of Treasurer's office.....	25 00
Oct.	14	F. H. Schneider, expenses of Treasurer's office for June, July and August.....	61 50
Oct.	14	M. J. Belton, refund of initiation fee.....	5 00
Oct.	25	W. Horace Hoskins, expenses on Western trip.....	159 78
Oct.	25	The Cayuga Press, printing stationery.....	12 50
Nov.	23	The Modern Press, printing 1,000 membership cards.....	8 50
Nov.	23	W. H. Hoskins, wreath of flowers for Dr. Gill.....	10 00
Nov.	23	The Modern Press, printing cards.....	8 50
Nov.	23	Library Bureau, filing case.....	28 75
Nov.	23	The Ravenswood Press, printing card ballots.....	10 85
Nov.	23	Bean, Wartens & Co., books and files for M. Jacob.....	2 35
Nov.	23	N. S. Mayo, expenses of Secretary's office for October.....	128 40
Nov.	23	N. S. Mayo, salary as Secretary.....	100 00
Dec.	21	V. A. Moore, President's office expenses.....	14 00
Dec.	21	Cassius Way, expenses inspecting veterinary colleges for Committee on Intelligence and Education.....	36 79
Dec.	21	Addressograph Company.....	7 75
Dec.	21	N. S. Mayo, salary for November, 1918.....	100 00
Dec.	21	N. S. Mayo, revolving fund for expenses.....	200 00
Dec.	21	N. S. Mayo, expenses Secretary's office for November.....	85 45
Dec.	21	The Ravenswood Press, printing stationery.....	20 75
Dec.	31	N. S. Mayo, salary for December, 1918.....	100 00
1919			
Jan.	6	N. S. Mayo, expenses Secretary's office for December.....	83 04

Jan.	6	Doll & Mynderse Co., premium on Treasurer's bond	35 00
Jan.	6	The Ravenswood Press, printing letterheads.	74 75
Jan.	6	The Ravenswood Press, printing application for membership.	24 75
Jan.	6	The Ravenswood Press, printing letterheads and envelopes.	46 50
Jan.	6	Mrs. H. R. Millard, refund of dues of H. R. Millard.	5 00
Jan.	22	G. H. Smith, clerical services.	2 50
Jan.	22	Commercial Stationery and Loose Leaf Co., office equipment.	6 76
Feb.	10	The Ravenswood Press, printing envelopes.	89 00
Feb.	10	N. S. Mayo, salary for January.	100 00
Feb.	10	N. S. Mayo, expenses of Secretary's office for January.	70 57
Feb.	18	Wayne Alter, balance refund on application.	2 00
March	8	N. S. Mayo, salary for February.	100 00
March	8	O. A. Longley, refund on application of E. L. Blumenshine.	5 00
March	8	N. S. Mayo, expenses of Secretary's office for February.	35 80
March	8	N. S. Mayo.	73 71
March	8	The Underwood Typewriter Co., typewriter.	70 00
March	15	City National Bank, Dominion of Canada Bonds.	3,023 20
March	17	V. A. Moore, office expenses for President.	10 78
March	17	The Ravenswood Press, printing envelopes, etc.	7 15
April	7	N. S. Mayo, salary for March.	100 00
April	7	N. S. Mayo, expenses of Secretary for March.	59 00
April	18	The Modern Press, printing membership cards.	25 00
April	18	E. J. Sieburg, refund on application.	3 75
April	18	H. S. Murphey, report of Committee on Anatomical Nomenclature.	42 28
May	3	H. D. Bergman, expenses inspection trip representing Committee on Intelligence and Education	86 03
May	3	N. S. Mayo, salary for April.	100 00
May	3	N. S. Mayo, expenses Secretary's office for April.	45 36
May	20	W. Horace Hoskins, expenses Salmon Memorial Committee.	16 08
May	20	S. J. Walkley, expenses Committee on Legislation.	157 60
May	20	W. Horace Hoskins, expenses Committee on Legislation.	1 18 79
May	20	Geo. W. Dunphy, expenses inspecting veterinary colleges.	52 90
May	20	T. E. Munce, expenses on Committee on Legislation.	14 18
June	3	The Ravenswood Press, printing voucher blanks.	6 50
June	3	Cassius Way, expenses in connection Committee on Intelligence and Education.	100 62
June	3	Geo. H. Hart, expenses in connection Committee on Intelligence and Education.	132 80
June	10	The Ravenswood Press, letterheads and envelopes.	16 00
June	10	N. S. Mayo, salary for May.	100 00
June	10	N. S. Mayo, expenses Secretary's office for May.	41 02
June	23	Louis A. Klein, expenses attending of American Association of Pharmaceutical Chemists.	15 24
June	23	G. H. Roberts, postage as Resident Secretary.	19 50
June	23	V. A. Moore, expenses of President's office.	7 65
July	8	N. S. Mayo, salary for June.	100 00
July	8	N. S. Mayo, expenses Secretary's office for June.	25 92
July	8	The Ravenswood Press, printing application blanks	8 75
July	15	W. Horace Hoskins, expenses Legislation Committee.	29 21
July	15	W. Horace Hoskins, expenses Salmon Memorial Fund.	3 46

July	15	S. J. Walkley, expenses Committee of Legislation..	56 34
July	21	C. H. Noffinger, refund on rejected application....	4 00
July	21	Jas. T. Seely, expenses as Resident Secretary.....	3 00
July	21	The Ravenswood Press, printing letterheads and envelopes.....	7 00
Aug.	11	N. S. Mayo, salary for July.....	100 00
Aug.	11	N. S. Mayo, expenses of Secretary's office for July..	35 68
Aug.	11	The Ravenswood Press, printing stationery.....	78 00
Aug.	30	W. Horace Hoskins, expenses Legislation Committee.....	53 79
Aug.	30	S. J. Walkley, expenses Legislation Committee....	21 90
Sept.	6	N. S. Mayo, expenses Secretary's office for August..	126 29
Sept.	6	N. S. Mayo, salary for August.....	100 00
Sept.	6	W. Horace Hoskins, account Salmon Memorial Fund.....	293 01
Sept.	6	The Ravenswood Press, printing stationery.....	7 50
Sept.	19	S. J. Walkley, expenses Committee on Legislation..	24 20
Sept.	19	V. A. Moore, office expenses as President.....	15 07
Sept.	19	W. Horace Hoskins, postage Salmon Memorial Fund.....	3 14
Sept.	27	E. I. Smith, expenses as Resident Secretary.....	4 12
Sept.	27	The Ravenswood Press, printing envelopes.....	13 50
Oct.	9	N. S. Mayo, expenses Secretary's office for September.....	98 72
Oct.	9	A. M. Wright, refund on application and dues....	16 00
Oct.	9	The Ravenswood Press, printing stationery.....	27 50
Oct.	9	N. S. Mayo, salary for September.....	100 00
Oct.	9	M. B. Mertens, refund on application.....	3 00
Oct.	9	American Surety Co. of N. Y., surety bond of N. S. Mayo.....	12 50
Oct.	20	Doll & Mynderse Co., premium on Treasurer's bond.....	35 00
Oct.	20	S. J. Walkley, expenses Committee on Legislation..	30 90
Oct.	20	Bonsley, Florist, wreath flowers for Harry Moore..	20 00
Oct.	25	The Ravenswood Press, printing 1,000 application blanks.....	7 50
Oct.	25	The Ravenswood Press, printing cards.....	24 85
Oct.	31	John S. Grove, expenses Resident Secretary's office.	3 80
			<hr/>
			\$ 9,225 82

EXPENDITURES

Journal Fund

1918			
Oct.	14	H. J. Bool Co., packing and drayage on material in connection with transfer to Baton Rouge, La....	79 12
Oct.	14	P. A. Fish, work in connection with above transfer..	30 00
Oct.	14	Norton Printing Co., printing September issue....	633 08
Oct.	25	Ramires-Jones Printing Co., printing Journal and stationery.....	605 40
Oct.	25	Miss Byrne Monget, salary for September.....	60 00
Oct.	25	W. H. Dalrymple, salary for September.....	125 00
Oct.	25	Bigelow Binder Co., June account.....	1 95
Nov.	23	Miss Byrne Monget, salary for October.....	60 00
Nov.	23	W. H. Dalrymple, salary for October.....	125 00
Nov.	23	Ramires-Jones Printing Co., printing Journal.....	721 64
Dec.	21	J. B. Kroger & Son, shelves.....	14 40
Dec.	21	W. H. Dalrymple, expenses attending Executive Board.....	110 08
Dec.	21	W. H. Dalrymple, salary for November.....	125 00
Dec.	21	Miss Byrne Monget, salary for November.....	60 00
Dec.	21	J. K. Roumain, typewriter table and chair.....	4 00
Dec.	21	J. K. Roumain, office rent.....	28 00

Dec.	21	Ramires-Jones Printing Co., printing Journal for December.....	616 72
1919			
Jan.	21	W. S. Hall for purchase of \$3,000 in Liberty Bonds	2,850 00
Jan.	22	Miss Byrne Monget, salary for December.....	60 00
Jan.	22	W. H. Dalrymple, salary for December.....	125 00
Jan.	22	J. K. Roumain, rent of office and storeroom for December.....	28 00
Jan.	22	Ramires-Jones Printing Co., printing December Journal, etc.....	716 00
Feb.	18	W. H. Dalrymple, subscription for Journal for W. Alter.....	3 00
Feb.	18	W. H. Dalrymple, salary for January.....	125 00
Feb.	18	Miss Byrne Monget, salary for January.....	60 00
Feb.	18	Ramires-Jones Printing Co., printing 4,500 copies extra edition of January number.....	772 60
Feb.	18	Bigelow Binder Co., binders.....	14 50
Feb.	18	J. K. Roumain, rent of office and storeroom.....	28 00
March	8	Addressograph Co., purchases for December and January.....	18 63
March	8	Ramires-Jones Printing Co., printing stationery.....	4 00
March	8	Ramires-Jones Printing Co., printing February number.....	670 50
March	17	J. K. Roumain, rent of office and storeroom.....	28 00
March	17	Ortlieb-Ranney Printing Co., printing stationery.....	14 00
March	29	Miss Byrne Monget, salary for February.....	60 00
March	29	W. H. Dalrymple, salary for February.....	125 00
March	29	Ramires-Jones Printing Co., printing November number.....	721 75
March	29	Addressograph Co., stencils furnished.....	6 38
April	18	J. K. Roumain, rent of office and storeroom.....	28 00
April	18	J. E. Ortlieb Printing Co., printing stationery.....	9 00
April	18	Ramires-Jones Printing Co., printing Journal.....	764 82
April	18	W. H. Dalrymple, salary for March.....	125 00
April	18	Miss Byrne Monget, salary for March.....	60 00
May	3	National Blank Book Co., binders.....	34 58
May	20	Addressograph Co., May account.....	6 55
May	20	Ramires Jones Printing Co., printing May Journal.....	846 85
May	20	Miss Byrne Monget, salary for April.....	60 00
May	20	J. K. Roumain, rent of office and storeroom.....	28 00
May	20	W. H. Dalrymple, salary for April.....	125 00
June	23	W. H. Dalrymple, salary for May.....	125 00
June	23	Ramires-Jones Co., printing June Journal.....	838 55
June	23	J. K. Roumain, rent of office and storeroom.....	28 00
June	23	Miss Byrne Monget, salary for May.....	60 00
July	8	Addressograph Co., stencils.....	5 05
July	15	Ramires-Jones Printing Co., printing July Journal.....	780 24
July	15	J. K. Roumain, rent of office and storeroom.....	28 00
July	15	Miss Byrne Monget, salary for June.....	60 00
July	15	W. H. Dalrymple, salary for June.....	125 00
Aug.	20	W. H. Dalrymple, salary for July.....	125 00
Aug.	20	Miss Byrne Monget, salary for July.....	60 00
Aug.	20	J. K. Roumain, rent of office and storeroom.....	28 00
Aug.	20	Ramires-Jones Printing Co., printing August Journal.....	840 67
Sept.	9	J. K. Roumain, rent of office and storeroom.....	28 00
Sept.	19	W. H. Dalrymple, salary for August.....	125 00
Sept.	19	Miss Byrne Monget, salary for August.....	60 00
Sept.	19	Ramires-Jones Printing Co., printing September Journal.....	905 88
Sept.	27	The Addressograph Co., stencils.....	7 11
Oct.	25	J. K. Roumain, rent of office and storeroom.....	35 00

Oct.	25	The Addressograph Co., September account	7 18
Oct.	25	J. E. Ortlieb, printing 400 postal cards	7 00
Oct.	25	Miss Byrne Monget, salary for September	60 00
Oct.	25	W. H. Dalrymple, salary for September	125 00
Oct.	25	Ramires-Jones Printing Co., printing October Journal	845 99

\$ 17,257 22

EXPENDITURES

Relief Fund

1918			
Dec.	28	Mrs. W. Horace Hoskins, Treasurer Auxiliary Relief Fund	\$ 500 00
1919			
April	1	City National Bank to be forwarded to Prof. H. Vallée	2,502 46
			\$ 3,002 46

Knoxville, Tenn., November 4, 1919

Dr. M. Jacob, Treasurer,
American Veterinary Medical Association,
Knoxville, Tennessee.

Dear Sir:—

We enclose herewith cancelled checks and statements of the balances as of this date in the following accounts:

American Veterinary Medical Association	\$ 7,364 03
Journal Fund	8,334 23
Relief Fund	1,693 48

Yours truly,

THE CITY NATIONAL BANK,
R. E. MOONEY, Vice-Pres.

THE PRESIDENT: You have heard the report. What is your pleasure?

DR. HOSKINS: The same correction ought to be made there that was in the Secretary's report—about the \$500.

THE PRESIDENT: It will be referred to the Auditing Committee.

DR. MAYO: Mr. President, I have some more applications that have been approved and recommended for election by the Executive Board, and I will read them.

(Dr. Mayo read the list.)

DR. HOSKINS: I move the recommendation be approved.

(The motion was seconded and carried.)

REPORTS OF COMMITTEES

THE PRESIDENT: The next item on the program is the report of the Editor. That, I believe, goes to the Executive Board. The next is the reports of committees. The first committee is that on Intelligence and Education. Dr. George W. Dunphy, Chairman, not being present, the matter will be laid over until later. The next is the report of the Committee on Legislation.

DR. HOSKINS: That will have to be laid over.

THE PRESIDENT: Next is the Committee on Resolutions, which I think of necessity will be laid over. The next is the Audit Committee, Dr. Ryder, Chairman.

DR. H. R. RYDER (Chicago): The Committee is not ready to report yet.

THE PRESIDENT: Committee on Necrology, Dr. Conway.

(The Committee was not ready to report.)

THE PRESIDENT: The Committee on History, Dr. R. C. Moore.

DR. R. C. MOORE (St. Joseph, Mo.): The Committee would like to have a little more time.

THE PRESIDENT: Next is the Committee on Anatomical Nomenclature, Dr. Murphey, Chairman.

DR. MURPHEY (Ames, Iowa): Mr. President and Members of the Association, I believe it would be advisable to read simply a letter and not a list of terms.

The Committee on Anatomical Nomenclature reports for the year 1919 as follows:

1. We are submitting the second list of terms which, with the first list published in the 1913 proceedings, have been submitted to and accepted by the veterinary anatomists of North America. The lists of terms are considered a part of this report.

2. We move their adoption and publication by this Association.

3. We move that the Committee be continued to prepare and submit a table of suggested English equivalents together with such additions and corrections as are necessary to conform to the lists of the American Association of Anatomists; and that the Committee be directed to cooperate with the veterinary anatomists of other English-speaking countries in the preparation of said lists of anatomical terms.

4. We urge and advise the general adoption of these terms for all branches of veterinary medicine in the interest of brevity, uniformity and clearness.

H. S. MURPHEY,
F. W. CHAMBERLAIN,
MARK FRANCIS.

DR. W. H. HOSKINS: I move it be received and referred to the Executive Board for action.

DR. MURPHEY: Mr. President, I believe the committee felt that it was their prerogative to move the adoption. We did so move.

(The motion was seconded by Dr. Wm. Herbert Lowe.)

DR. MURPHEY: The committee moved the adoption and acceptance of this report as one part, and as a second part further cooperation with the American Association of Anatomists in the final preparation of the list. Explanatory to this, I might say, that we feel that inasmuch as the Association started this work originally, and that as the lists are finally submitted, they ought to be approved, but subject to minor corrections to conform to a list which is in preparation on the whole matter of human and comparative anatomy.

THE PRESIDENT: The chairman of the committee feels, as I understand the question, that this report should be adopted or rejected and not merely received.

DR. W. H. HOSKINS: The chairman doesn't read anything but the transcript of the report; he fails to tell us the changes. It seems to me the Executive Board could come to some conclusion after the examination.

DR. MURPHEY: I believe I have the first motion before the house in presenting this report. I believe that the second motion is out of order.

THE PRESIDENT: Did the chairman of the committee make a motion?

DR. MURPHEY: The first thing was that we move the adoption and publication by the Association.

(Dr. Murphey's motion was seconded and carried.)

DR. CHARLES E. COTTON (Minneapolis, Minn.): I think the members of this body should know that the chairman of this committee has been made a member of the American Association of Anatomists. All other members of that association are human anatomists. They are to revise the nomenclature of all branches of anatomy.

THE PRESIDENT: I think that is a very merited recognition and I am glad it was brought before the members. I believe the Executive Board will undoubtedly make recommendations regarding the disposal of this very elaborate piece of work that has been performed by this committee. Next is the Committee on Army Veterinary Service.

(There was no report from this committee. The Budget Committee was not yet ready to report.)

THE PRESIDENT: The next is the Salmon Memorial Committee, Dr. J. F. Winchester, chairman.

DR. W. H. HOSKINS: The chairman asked me to report for him.

REPORT OF THE SALMON MEMORIAL FUND

This Committee, after a period of quiescence for the past two years, owing to the many war-fund calls and our own Veterinary Relief Fund, resumed its efforts toward the completion of this fund.

The total amount now in hand and subscribed has passed the \$5,000 mark, or one-half the amount contemplated by the Committee. Some subscriptions were contingent on this amount being raised.

During the year an amount reaching \$293.01 collected from the profession in New York State was placed in the Committee's hands. A balance collected from the Bureau of Animal Industry veterinarians, remaining after the procuring of a beautiful portrait that now hangs on the office wall of the Chief of the Bureau at Washington, amounting to \$515.86, was turned over to the Committee. From Minnesota came \$55 collected in \$1 subscriptions at one of their meetings. Twelve additional subscriptions of \$25 each has been added to the list, making the number 41. This list we hope to reach 50 in number.

The expense incurred during the year has not reached \$30, which

in accordance with the action of this Association was paid from the funds of the Association, and all subscriptions and interest have gone to the completion of the fund.

The amount received since January 1, 1919, to November 12, inclusive, reaches the sum of \$1,299.87. The amount in bank to same date, \$4,072.64. About \$1,000 pledged, part of this contingently, brings the amount, in round numbers, to \$5,000. This will be greatly added to before the expiration of the year, as the plans recently inaugurated to complete this fund attain their fruition.

Respectfully submitted,

W. HORACE HOSKINS, *Sec'y-Treas.*

STATE CONTRIBUTIONS TO SALMON MEMORIAL FUND

New York	\$647.07	Virginia	\$59.00
District of Columbia.....	614.86	Missouri	52.00
Iowa	469.61	Tennessee	51.00
Minnesota	236.00	Montana	33.00
Ohio	220.00	California	27.00
Pennsylvania	212.00	Louisiana	25.00
Massachusetts	205.00	Mississippi	20.00
Michigan	194.00	Army Veterinarians.....	17.00
New Jersey	165.00	Colorado	16.00
Indiana	138.00	Maine	15.00
Illinois	131.00	South Carolina.....	5.00
Wisconsin	106.00	North Dakota.....	2.00
Canada	75.25	Georgia	1.00
Connecticut	73.00	Texas	1.00

TWENTY-FIVE DOLLAR SUBSCRIPTIONS TO THE SALMON MEMORIAL FUND

- Dr. J. C. Meyer, 1111 Walnut St., Cincinnati, Ohio.
- Dr. Lester H. Howard, 187 Huntington Ave., Boston, Mass.
- Dr. S. H. Gilliland, Philadelphia, Pa.
- Dr. M. N. McKillip, 1639 Wabash Ave., Chicago, Ill.
- Dr. Robert W. Ellis, 477 West 150th St., New York City.
- Dr. C. J. Marshall, 39th and Woodland Ave., Philadelphia, Pa.
- Dr. D. M. Campbell, Chicago, Ill.
- Dr. F. J. De Vine, Goshen, N. Y.
- Dr. W. H. Dalrymple, Baton Rouge, La.
- Dr. C. M. Haring, Berkeley, Calif.
- Dr. Samuel Brenton, Detroit, Mich.
- Dr. E. B. Ackerman, 215 Washington St., Brooklyn, N. Y.
- Dr. Elijah E. Patterson, Detroit, Mich.
- Dr. Charles E. Cotton, Minneapolis, Minn.
- Dr. J. G. Rutherford, Alberta, Canada.
- Dr. John V. Newton, Toledo, Ohio.
- Dr. J. T. Claris, Buffalo, N. Y.
- Dr. J. F. Winchester, Lawrence, Mass.
- Dr. Samuel Brenton, Detroit, Mich. (Second contribution.)
- Dr. W. Horace Hoskins, 338 E. 26th St., New York City.
- Dr. James Law, Ithaca, N. Y.
- Dr. U. G. Houck, B. A. I., Washington, D. C.
- Dr. George H. Berns, Brooklyn, N. Y.
- Drs. Baker and McClelland, Buffalo, N. Y.
- Dr. F. H. Gage, Veterinary Corps of U. S. Army.
- Dr. John R. Mohler, B. A. I., Washington, D. C.
- Dr. W. G. Hollingworth, Utica, N. Y.
- Dr. P. A. Fish, Ithaca, N. Y.
- Dr. Otto Faust, Poughkeepsie, N. Y.

Dr. Veranus A. Moore, Ithaca, N. Y.
Dr. A. T. Kinsley, Kansas City, Mo.
Dr. Wm. Herbert Lowe, Paterson, N. J.
Dr. H. Jensen, Kansas City, Mo.
Dr. Fred Torrance, Ottawa, Canada.
Dr. J. W. Scheibler, 271 Court Ave., Memphis, Tenn.
Dr. M. Jacob, Nashville, Tenn.
Dr. L. A. Merillat, Orrville, Ohio.
Dr. Robert S. MacKellar, 351 West 11th St., New York, N. Y.
Dr. H. B. Cox, 1516 Snyder Ave., Philadelphia, Pa.
Dr. Adolph Eichhorn, Pearl River, N. Y.
Drs. McAuslin and McAuslin, Brooklyn, N. Y.

THE PRESIDENT: You have heard the report. What shall be done with it?

DR. MURPHEY: I move we refer it to the Executive Board.

DR. W. H. HOSKINS: Most of the members of the committee are located in this zone, and an effort to get them to work hard has been of no avail. In the West we had another member that has not been active. By the plans which we have now devised and which we are going to carry out in the whole, we ought to be able to accomplish something.

(The motion was seconded and carried.)

THE PRESIDENT: Next is the report on Liautard Memorial, Dr. Ellis to report.

(Dr. Ellis not being present, there was no report.)

THE PRESIDENT: Next is the report of the special Committee on Veterinary Reconstruction Work for the United States, Dr. Mohler, chairman.

DR. J. R. MOHLER (Washington, D. C.): Mr. Chairman, your committee submits the following report. Unfortunately, the correspondence with the other members of the committee failed to produce any reconstructive views and I anticipated meeting a few of them here, but thus far only one member has appeared. Therefore what I am going to say will represent only the chairman's views.

(Dr. Mohler read his report. It will be published later.)

THE PRESIDENT: You have heard this report. What shall we do with it?

DR. KINSLEY: Mr. Chairman, I move you the report be adopted.

(The motion was seconded and carried.)

THE PRESIDENT: The next is the report of the International Committee on Bovine Tuberculosis. There is a little mistake on this program. Dr. Rutherford, who was chairman of this committee, early in the year expressed his inability to perform the duties of that office, but we desired to have him continue as a member, and at his suggestion Dr. J. G. Wills was asked to act as chairman of the committee. Later Dr. Rutherford resigned and Dr. Torrance was appointed in his place. Dr. Wills, however, has acted as chairman of this committee in the preparation of the report. We will hear Dr. Wills.

DR. J. G. WILLS (Albany, N. Y.): Mr. President and members of the Association, owing to but one other member of the committee

so far appearing, except myself, it has not been possible to go over this final report as fully as we would wish. A tentative report was submitted to the members and a final report has been gone over by Dr. Cotton, who is the other member of the committee here, and myself.

REPORT OF COMMITTEE ON BOVINE TUBERCULOSIS

In the preparation of a report on bovine tuberculosis your committee has been confronted with the difficulty of having no specific recommendations or new theories to advance. The vast amount of work done and numerous papers, pamphlets and publications prepared dealing with this subject have so fully covered the ground that there is little new material left for presentation at this time. It was felt, however, that a summary of the progress made since the last report by the International Committee on Bovine Tuberculosis justified our submitting a general report on the situation now existing, with an attempt at gathering together and making comment upon some of the most recent developments.

As a preliminary statement it would appear that the most important advance in recent years in the eradication of bovine tuberculosis is the tuberculosis-free accredited-herd plan. This system has been put in quite general operation in the United States and more recently inaugurated in the Dominion of Canada. It should be stated that the influence which brought about the introduction of this method in the tuberculosis eradication problem are directly traceable to the work done by the International Commission of the American Veterinary Medical Association many years ago. Your committee believes that this plan is based on sound and logical principles and is capable of being developed into a potent force in bringing about the control of tuberculosis in the bovine. It must be conducted in such a way as to secure the hearty cooperation of the cattle owner, the authorities in charge of live-stock sanitary control work, and the veterinary profession. It will not succeed unless scientific principles are followed and the supervision by competent men secured. In the appendix of this report will be found copies of the uniform regulations adopted by the United States and Canadian Governments covering this method. It is understood that these rules will of necessity have to be modified from time to time and that they will not meet all conditions or always receive the unanimous support of all concerned. It is believed that they form the basis for a better organized plan for combating this great plague to the end that success may ultimately be assured.

Your committee feels that it should take a definite position on the question of tuberculin and is warranted in stating that this product forms the principal basis and groundwork for diagnosis of the disease; that the subcutaneous method is the most widely adopted and must be relied upon as the general standard under most conditions. We realize that the ophthalmic and intradermal methods are both of value and under certain conditions may be preferable. In any method adopted for examination of a herd your committee desires to

emphasize the necessity of the work being done by properly trained and equipped men and in such a manner as to insure a maximum of accuracy in every respect.

The careful reading of thermometers, attention to control of the animal as regards feed and water, and taking sufficient temperatures before and after injection of tuberculin are all of the utmost importance if accurate results are to be obtained. Success or failure in the eradication of the disease from the herd is largely a matter of skill on the part of the examiner, coupled with proper equipment and help from the animal owner.

We believe that frequently a combination of several or of all known methods may be of advantage, for the reason that there is a greater probability of infection being detected if several methods are used, providing they do not interfere one with the other.

It should be understood that positive indications of infection shown by any reasonably reliable test should be accepted in preference to the negative manifestations of any other test. In other words, the positive evidences of reaction should outweigh negative evidences under all ordinary conditions.

In the application of any test we wish to emphasize the importance of careful observation of the individual animal while under examination. It is generally conceded that many of the alleged deficiencies of tuberculin have been due to the failure of the examiner to recognize and interpret clinical symptoms in the animal before him. The escape of the so-called "spreaders" from detection by the test is the principal means whereby the disease is enabled to perpetuate itself and has been the means of undoing many attempts at control or eradication.

The examination should be considered from a clinical as well as a physical standpoint. Much valuable data have been lost in the past due to the lack of careful observation of the animal after the administration of tuberculin. A comprehensive study of these phenomena and their comparison with the postmortem results would be of great value in determining the relationship, if any, existing.

The practice of retesting animals that have once definitely reacted should be discouraged as unnecessary and only tending to confusion and misunderstanding.

Your committee views with great regret the tendency on the part of many veterinarians, particularly of the younger generation, to rely upon diagnostic aids, both biologic and mechanical, to the complete exclusion of their own natural senses. The inclination of the examiner to depend entirely upon the artificial aids that he employs, rather than supplementing such aids by his own observation and abilities, has resulted and is resulting disastrously in many cases, with the effect of making the physical diagnosis of this disease an almost forgotten art in the hands of many veterinarians. The mechanical apparatus now at our command has developed a tendency to rely upon such outside aids and to create in the minds of many the erroneous belief that this, a biological problem, may be

solved by the application of mechanical principles. An important objection to carelessness in connection with the physical examination of the animal is the opportunity presented for criticism of the examiner and the efficiency of the means he employs where unsatisfactory developments occur later.

Your committee wishes to point out the necessity of careful investigation and study as to the channels for distribution of tuberculous organisms and consequent opportunity for spread of the disease. It is possible that there are unsuspected means of exposure which require attention. The work of Van Es wherein it has been shown that sparrows serve as distributors of the virus should be considered. The investigations by the Federal station at Bethesda, Md., indicate that mice may have some significance in a similar way. These are important and should be given further attention and study.

It is unfortunate that the cleansing and disinfection of premises where diseased animals have been kept has not received more careful attention in the past, since this is a prolific means of the disease being carried from animal to animal or from herd to herd. It not infrequently happens that after much time and money have been expended in the detection and removal of the reactors the thorough destruction of the virus remaining in stables or premises is almost entirely ignored. The disposal of any and all infected material is essential after the removal of the diseased individuals, if susceptible cattle are later to be placed on such premises. In the past there has been some tendency to lose sight of the importance of rendering the virus outside of the animal itself inert and non-infective.

Your committee feels that there is opportunity for closer cooperation between the medical and veterinary professions in the tuberculosis problem. It is now generally conceded that the possibility of transmission of the germ of the bovine type is limited almost entirely to young children, and likewise generally understood that the danger of transmission of the human type of the germ to the animal is comparatively unimportant. The presence, therefore, of bovine tuberculosis in dairy cattle would seem to be of more importance to the medical profession because of the possibility of transmission of the disease to children than would the presence of human tuberculosis in relation to danger to the animal kingdom. However, since the entire problem bears relationship to the welfare of the human family, the veterinarian must necessarily be concerned with the danger to the human from the organism in the bovine. In a matter of such vital importance it is better to err on the side of safety, and when one realizes the limitations of science so often painfully demonstrated in the past, and the frequent changes in the attitude of scientists following fresh discoveries, there would appear to be full justification for the adoption of all possible precautions to prevent the infection of human beings with bovine tuberculosis. It is believed that much good would come

from more systematic and concentrated effort between the two professions than seems to be the case at the present time.

Your committee feels that it should point out the importance of proper isolation, so far as practicable, of individual cattle, particularly while stabled, by means of individual mangers and drinking and feeding troughs. Attention has been given in human medicine in recent years to the individual drinking cup, and the proper sanitary control of receptacles for feed and drink is a principle entirely applicable to the control of infections in animals. It is of course not possible to carry this isolation to the extent of entirely avoiding contact between individuals or even approaching that ideal. Reducing the opportunity, however, of disease organisms being distributed can not fail to limit the distribution of infection. Repeated evidences of this principle could be given.

The interchange of cattle from State to State, from county to county and even from herd to herd is a fertile means for the distribution of infection. It is possible that in time more drastic control of such traffic will be necessary, and your committee believes that this Association should through its membership or even by resolution point out and prepare those interested for more severe restrictions on interchange of such animals. The prohibition against disposition except for slaughter of cattle coming from herds in which the percentage of reactors has reached dangerous proportions would have an important effect in reducing the distribution of disease by such interchange. The custom which at present generally prevails of allowing the distribution of animals without restraint except a health certificate issued on the basis of the conditions found in the individual animal is far from affording the protection that such a certificate is commonly accepted as carrying.

In other words, the practice of breeders and dealers of testing only the animals which they sell and of disposing of those that pass satisfactory test, irrespective of the percentage of infection known or unknown to exist in the herd, offers no definite assurance that the individual examined is not carrying the germs of disease in its system. The frequency with which animals purchased under such conditions are the means of carrying infection into healthy herds is sufficient evidence of the fallacy of such a procedure.

At the present time the tendency to require pasteurization of milk would seem to offer some hope as a means of insuring healthy young stock to take the place of diseased ancestors. Your committee believes that continued effort should be made to impress upon cattle owners the importance of the pasteurization of skim milk prior to its being used for the feeding of calves or hogs. There are countless instances on record where contaminated milk by-products have been the means of distribution of infectious diseases in communities where the practice prevails of distributing unpasteurized skim milk from public creameries or skimming stations.

We believe that the tendency in the past to place the great stress on the destruction of the diseased individual with lack of attention

to the other sources of infection has been one reason for lack of progress in eradication. When it is recognized by cattle owners and others interested that the protection of the individual, particularly while young, from exposure to infection is the most efficient method of control, we will then have made an important point in the fight against this great plague. It would seem that the protection of the younger generation from exposure to disease distributed by older animals offers the best possible weapon in controlling and eradicating bovine tuberculosis.

Your committee suggests consideration as to the advisability of continuing this committee. In the absence of new developments or of radical departures from established methods little remains to report except progress from year to year.

J. G. WILLS,
CHARLES E. COTTON.

APPENDIX TO REPORT OF COMMITTEE ON BOVINE TUBERCULOSIS

THE UNITED STATES PLAN

Uniform methods and rules for tuberculosis-free accredited herds of purebred cattle, as adopted by the United States Live Stock Sanitary Association and by representatives of purebred cattle breeders' associations and approved by the United States Bureau of Animal Industry.

1. A tuberculosis-free accredited purebred herd is one which has been tuberculin tested by the subcutaneous method, or any other test approved by the Bureau of Animal Industry, under the supervision of the Bureau of Animal Industry, or regularly employed veterinary inspector of the State in which cooperative tuberculosis eradication work is being conducted jointly by the United States Department of Agriculture and the State. Further, it shall be a herd in which no animal affected with tuberculosis has been found upon two annual or three semiannual tuberculin tests, as above described, and by physical examination.

2. The entire herd, or any cattle in the herd, shall be tuberculin tested or retested at such time as is considered necessary by the Federal and State authorities.

3. No cattle shall be presented for the tuberculin test which have been injected with tuberculin within 60 days immediately preceding or which have at any time reacted to a tuberculin test.

4. No herd shall be classed as an accredited herd in which tuberculosis has been found by the application of the test, as referred to in paragraph 1, until such herd has been successfully subjected to two consecutive tests with tuberculin, applied at intervals of not less than six months, the first interval dating from the time of removal of the tuberculous animal from the herd.

5. Prior to each tuberculin test satisfactory evidence of the identity of the registered animals shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with animals of the herd, shall be identified by a tag or other marking satisfactory to the State and Federal officials.

6. All removals of registered cattle from the herd, either by sale, death, or slaughter, shall be reported promptly to the said State or Federal officials, giving the identification of the animal and, if sold, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed

to associate with the herd which have not passed a tuberculin test approved by the State and Federal officials.

7. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurized by heating to not less than 150° F. for not less than 20 minutes.

8. All reasonable sanitary measures and other recommendations by the State and Federal authorities for the control of tuberculosis shall be complied with.

9. Cattle from an accredited herd may be shipped interstate, by certificate obtained from the office of the State live-stock sanitary officials of the State in which the herd is located or from the office of the Bureau of Animal Industry, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

10. Strict compliance with these methods and rules shall entitle the owners of tuberculosis herds to a certificate, "Tuberculosis-Free Accredited Herd," to be issued by the Bureau of Animal Industry and the State live-stock sanitary authority. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

11. Failure on the part of owners to comply with the letter or spirit of these methods and rules shall be considered sufficient cause for immediate cancellation of cooperation with them by the State and Federal officials.

CANADIAN REGULATIONS

Dominion of Canada—Department of Agriculture—Health of Animals Branch. Regulations for the Establishment and Maintenance of Tuberculosis-Free Accredited Herds of Cattle

1. A tuberculosis-free accredited purebred herd is one which has been tuberculin tested by the subcutaneous method, or any other test approved by the Veterinary Director General, and applied by the regularly employed veterinary inspectors of the Health of Animals Branch of the Federal Department of Agriculture. Further, it shall be a herd in which no animal affected with tuberculosis has been found upon two annual or three semi-annual tuberculin tests, as above described, and by physical examination.

2. The entire herd, or any cattle in the herd, shall be tuberculin tested or retested at such time as is considered necessary by the Veterinary Director General.

3. No cattle shall be presented to the tuberculin test which have been injected with tuberculin within 60 days immediately preceding or which have at any time reacted to a tuberculin test.

4. No herd shall be classed as an accredited herd in which tuberculosis has been found by the application of the test, as referred to in paragraph 1, until such herd has been successfully subjected to two consecutive tests with tuberculin, applied at intervals of not less than six months, the first interval dating from the time of removal of the tuberculous animals from the herd.

5. Prior to each tuberculin test satisfactory evidence of the identity of the registered animal shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with animals of the herd, shall be identified by a tag or other markings satisfactory to the Veterinary Director General.

6. All removals of registered cattle from the herd, either by sale, death or slaughter, shall be reported promptly to the said Veterinary Director General, giving the identification of the animals, and, if sold, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed to associate with the herd which have not passed a tuberculin test approved by the Veterinary Director General.

7. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurized by heating to not less than 150° F. for not less than 20 minutes.

8. All reasonable sanitary measures and other recommendations by the Federal authorities for the control of tuberculosis shall be complied with.

9. Cattle from an accredited herd may be shipped to the United States accompanied by the certificate of the Veterinary Director General, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

10. Strict compliance with these methods and rules shall entitle the owner of tuberculosis-free herds to a certificate, "Tuberculosis-Free Accredited Herd," to be issued by the Veterinary Director General. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

11. Failure on the part of owners to comply with the letter or spirit of these methods and rules shall be considered sufficient cause for immediate cancellation of cooperation with them by the Federal officials.

12. Whenever in carrying out this order it is necessary to slaughter an animal or animals for the eradication of tuberculosis from a herd, the animal or animals shall be valued and compensation awarded as provided in Sections 6 and 7 of the Animal Contagious Diseases Act.

Persons desiring to enroll their herds under these regulations should apply to the Veterinary Director General, Ottawa, who will forward the official forms.

F. TORRANCE,

Veterinary Director General, Ottawa.

COMMUNICATIONS FROM MEMBERS OF THE COMMITTEE

BERKELEY, Cal., November 13, 1919.

To the Members of the A. V. M. A., New Orleans, La.—GENTLEMEN:

For one reason or another, your Committee on Bovine Tuberculosis has not met this year. The past year has no doubt been the most active in the history of the control of bovine tuberculosis and it therefore seems desirable that you should obtain some expression regarding this important subject from your committee.

The report submitted to this Association in September, 1910, by your commission was so comprehensive and free from erroneous statements and unwise recommendations that it has stood the test for the past nine years, and it seems to me that your present committee could do no better than to bring to your notice the developments that have been brought forward since the date of the above-mentioned report.

The two most important developments in the control of bovine tuberculosis are:

(1) The plan of accrediting tuberculous-free herds, and

(2) The attention that the methods, other than the subcutaneous tuberculin test, have received in the diagnosis of tuberculosis. Even these two phases of tuberculosis control did not entirely escape the notice of your first commission, for in 1912 that commission saw the wisdom of registering dairy herds known to be free from tuberculosis and asked, by letters, the Governments of the United States and Canada to take definite action in this matter. In their reports of 1913, 1915 and 1916 the commission mentioned other forms of tuberculin testing but did not think it advisable to adopt methods other than the subcutaneous test on the knowledge at hand at the time of their reports.

The certifying and accrediting of tuberculosis-free cattle by the United States Department of Agriculture, Bureau of Animal Industry, in co-operation with the various State live-stock agencies, should be highly commended. This is one of the most extensive moves ever undertaken in the

control of bovine tuberculosis, and the greatest feature of the plan is that it is entirely voluntary—no law to force cattle owners into this cooperative plan.

This plan will develop many tuberculous-free herds. It will also no doubt be attended by some setbacks, by uncontrollable, undesirable and unlooked-for results, but careful observation and interpretation of its failures will be a means of bringing to light new thoughts or more probably emphasize some already-known facts that have hitherto not received proper recognition. This was very evident to everybody present at the conference on tuberculosis held in Chicago October 6 to 8, inclusive. I now have in mind the open and free discussion on the various forms of tuberculin testing. This, however, leads up to the other important development since the last report and will be discussed presently.

In connection with the establishment of accredited tuberculous-free herds there appears to me to be a grave question as to the advisability of indiscriminately slaughtering animals that react to the tuberculin test. This procedure is now being practiced in establishing accredited herds. The bearing that reacting animals have upon the milk supply, the dairy industry and the development of the breeds in the community or the country at large should be carefully considered in determining the disposition of reacting animals. The establishment of individual or community tuberculous herds should receive due consideration.

We can no longer fail to recognize the place that forms other than the subcutaneous tuberculin testing have in the control of bovine tuberculosis. What the future will produce can not be absolutely foretold, but the evidence at present at hand makes it very plain that the intradermal tuberculin test is at least as accurate as the subcutaneous; that the ophthalmic test can replace neither of the above, but, in combination with them, it makes tuberculin testing more accurate; in fact, it has been demonstrated beyond dispute that a combination of tests should be made wherever possible, since no form of tuberculin testing detects all cases of tuberculosis, and since a tuberculous animal, while giving negative results to one form, may be positive with another form of tuberculin testing.

The intradermal injection of tuberculin gives rise to a thermal reaction when used in suitable doses. The practical application of this observation is very evident; that is, by one injection, one can make use of two diagnostic manifestations of tuberculin application, namely, (1) general reaction as indicated by a rise in temperature and (2) a local reaction. The San Francisco County Medical Milk Commission has taken advantage of this observation and has recently adopted this method for testing for additions to herds producing certified milk. The subcutaneous test was formerly used.

The physical examination for the detection of tuberculosis in cattle when used in conjunction with bacteriologic examination and tuberculin testing will no doubt add another safeguard in making cattle environs free from tuberculous cattle, and, in the final analysis, the control of bovine tuberculosis resolves itself into providing for the uninfected cattle environments which are free from tuberculous animals and from materials made infected by such animals.

To be able to make a proper physical examination is an attainment which every practicing veterinarian should strive to develop. To use it as above mentioned is highly recommended whenever practicable, but to depend upon it to the exclusion of other methods of diagnosis will lead to worse grief than does the use of tuberculin testing alone.

The activities of the various bodies interested in the control of bovine tuberculosis now under way will no doubt bring forth new facts and new thoughts, and it appears to me that your committee can serve no better purpose than to bring before you every year such new developments and suggest recommendations concerning them.

Respectfully submitted,

J. TRAUM.

CHICAGO, November 15, 1919.

DR. JOHN G. WILLS,
Committee on Bovine Tuberculosis,
American Veterinary Association,
New Orleans, La.

DEAR DOCTOR: We are living in an age of rapid radical changes which we believe will ultimately result in greater good for all the people. Theories of five years ago are facts today, and no man can safely say how many more time-honored usages may within the next five years go in the discard. In line with this idea of evolution and progress, I believe this occasion is timely to present a suggestion on tuberculosis control which, while it may appear revolutionary, is in fact merely in line with the best governmental practice demonstrated absolutely necessary, workable and advantageous during the war period.

The location of reactors is a comparatively simple matter. The disposition of reactors on a fair and equitable basis is the crux of the whole problem.

Owners of reactors who have acted in good faith in maintaining animals which in fact are a menace to the health of the people can hardly be expected to cheerfully consign such animals to slaughter with the prospect of carrying practically the entire burden of financial loss. I wish to suggest to this committee a plan by which the burden would be placed upon the public, to wit, the consumers of live-stock products.

Under this plan a Federal law would require a stamp tax imposed on every pound of meat, butter and cheese and every quart of milk or cream entering commercial distribution. This tax would be of such size as to provide a fund, of which the U. S. Department of Agriculture would be the custodian and distributor, from which would be paid the cost of all cattle condemned and slaughtered on account of tuberculosis, with, of course, proper credits for such hide, carcass and offal returns which would be possible under a careful system of handling.

To direct this work and properly administer this fund a commission or bureau would be provided by act of Congress with its sole concern the eradication of bovine tuberculosis in all classes of meat animals and poultry. The act would provide penalties for violation of the law and regulations.

I believe now is the time to begin work on this plan, as probably a considerable period would be involved in carrying it to the point of practical operation. Careful consideration by your committee is respectfully recommended.

Yours very truly,

J. J. FERGUSON.

THE PRESIDENT: There is one announcement that I wish to make. I am afraid it is required by the Constitution and By-Laws that the President appoint men to fill vacancies when they occur on committees and especially the Executive Board. Dr. Archibald is unable to be with us on account of illness, and he requested that one of two men from California should represent him on the Board. I do not think that either of those men are here. It is important that that district should be represented, and consequently I wish to announce the appointment of R. P. Marsteller to act as the substitute of Dr. Archibald during this session.

I wish also to call attention to a matter that I should have mentioned earlier, and that is, a letter that I received from Prof. Vallée in acknowledgment of the receipt of the money that was sent to the veterinarians of France and Belgium through this Association. The letter was exceedingly appreciative of the efforts and work of this

Association. I think that we should understand that Prof. Vallée and his colleagues on the other side are fully grateful for what we have done, which certainly was not very great.

The report of this Committee on Tuberculosis is before you for discussion. Are there any remarks?

DR. W. H. HOSKINS: In regard to the two men referred to as having some knowledge as to the means of propagation of tuberculosis, 10 or 15 years ago Dr. F. E. Weber was investigating tuberculosis in rats just outside of Lancaster. He found nearly 8 per cent of the rats affected with tuberculosis. His observations went further and he observed that those rats went all around that neighborhood, in the field, and would go out in the grass and have coughing fits and throw that material out of their lungs onto the grass, and observed in many instances great numbers of cattle that grazed there, consuming that grass. Later, plans were made to destroy those animals. Later on, in an endeavor to demonstrate the conditions where there was no proper meat inspection, they hired a store and exhibited some of the meat that was being killed there, bought from such sources, but local and other authorities thought the thing was dangerous for the public and suppressed the efforts of Dr. Weber.

THE PRESIDENT: Are there any other remarks, any further discussion? This matter comes under the head of Committee Reports.

DR. MUNCE: In view of the fact that the chairman of that committee suggested that the Association consider the advisability of continuing or discontinuing the committee, I move that the report be referred to the Executive Board.

(The motion was seconded and carried.)

THE PRESIDENT: Under the heading of Committee Reports would come the reports of the Resident State Secretaries. I should like to know if there are any who care to present their reports.

I wish to say on behalf of the State Secretaries that I believe they have been exceedingly active this year. They have done splendid work and they should have full recognition, and I do not doubt but what they have some very valuable reports. It would take some time to call on all of these. Are there any who have not submitted their reports, who would like to present them at this time? Dr. Hollingworth, would you like to present your report?

(Dr. Hollingworth responded negatively.)

THE PRESIDENT: If there are none and if there is no opposition they will be read by title and printed in the proceedings.

That concludes the work for this session unless some of the chairmen of the committees have come in since we went over the list. If there is any chairman of a committee who was absent when his committee was called, will he please come forward? If not, the meeting will stand adjourned until tomorrow, and I wish to call attention to the importance of prompt attendance at these section meetings tomorrow morning. The secretaries and chairmen of the sections have provided most valuable and instructive programs and we hope that you will each be in the section of your choice and that

you will see that all of the members who are in attendance are also present.

Has any one any further business to come before the meeting?

DR. EICHHORN: The extract of the letter which you conveyed to the members of the Association by Prof. Vallée, I think should be responded to, and I make a motion to the effect that a cablegram be sent to Prof. Vallée, expressing our willingness to continue the support of the leading members of the profession in the stricken countries.

(The motion was seconded and carried.)

THE PRESIDENT: Whom do you wish to formulate that cablegram? Do you wish to have a committee appointed?

DR. EICHHORN: It is up to the President.

THE PRESIDENT: I will appoint Dr. Eichhorn, Dr. Mohler and Dr. Dalrymple.

Adjournment.

(Proceedings to be continued.)

OTHER MEETINGS

ALUMNI OF NEW YORK UNIVERSITY

THE Veterinary College Alumni of New York University, which includes the graduates of New York College of Veterinary Surgeons and the American Veterinary College, after 40 years of a separate existence has combined with the alumni of the other eight schools and colleges in the General Alumni Association of New York University. The purpose of the amalgamation is to bring the united power of the alumni to bear upon the problems of all the schools and to establish a close relationship between the graduates and undergraduates. It is contemplated providing a fund of \$100,000 for the Veterinary College, whose chief interest is medicine as applied to animals and the interrelations of animal diseases and the health of the community.

The officers of the Veterinary Association are: Dr. George H. Berns, '79, President; Dr. William H. Kelly, '89, Vice-President; Dr. Adolph Eichhorn, '00, Secretary; and Dr. David W. Cochran, '80, Treasurer. The Executive Committee are Dr. L. H. Howard, '82, Boston; Dr. Robert W. Ellis, '89, New York; Dr. M. W. Drake, '90, Philadelphia; Dr. Thomas E. Smith, '97, Jersey City, N. J.; and Dr. W. C. Miller, '04, New York. Dr. William H. Lowe, representing the Veterinary College, is a director of the General Alumni Association. Mr. Howard F. Langland, '14, has been appointed Secretary of the General Alumni Association with offices at 512 Fifth Avenue, New York City.

CONFERENCE OF MARYLAND VETERINARIANS

THE first of a series of meetings of the veterinarians doing control and eradication work in the State of Maryland was held at the office of the State Board of Agriculture, Baltimore, on January 8, 1920. Dr. R. C. Reed, Chief of the Live Stock Sanitary Section of the Board, at whose instigation the meeting was called, presided. In his opening remarks he stated that the object of the meeting was to get together the Federal, State and practicing veterinarians for the purpose of an exchange of views on the methods and plans for the continuation of the regulatory and field work within the State.

The morning session was devoted to a symposium on bovine tuberculosis with special reference to the control and eradication of the disease by the accredited-herd plan. Dr. J. A. Kiernan of the Federal Bureau of Animal Industry was the chief speaker. He gave a very encouraging account of the progress of this work throughout the country. The keynote of his speech was the necessity of hearty cooperation between the live-stock owners, the veterinarians and the State and Federal authorities. After Dr. Kiernan's address the subject was discussed by several prominent veterinarians among whom were Drs. Lash, Ladson, Smith, Mackie, Gilfillan and several others. Dr. Pickens of the Maryland Live Stock Sanitary Laboratory made the statement that the laboratory was well equipped to handle the diagnosis of the infectious diseases and would be glad to aid the field men in every way possible.

The afternoon session was devoted almost entirely to hog cholera and its control. Dr. U. G. Houck of the Federal Bureau of Animal Industry gave the principal address. Among many other interesting things he stated that the Federal Government in cooperation with the States hopes to be able soon to start a national campaign to eradicate hog cholera from this country. He also emphasized the importance of careful technic in the administration of immunizing agents to hogs. The discussion was continued by Drs. Atherton, Melody, Cole and others.

Those present were Drs. Houck, Kiernan, Lash, Ladson, Arnold, Ernest, Benner, Simonds, Atherton, Cole, McLaughlin and Cass, of the Bureau of Animal Industry; Drs. Reed, Hoffman, Grapp, Sill, Pickens, Shivers, and Welsh of the State force, and the following practitioners: Drs. Koerner, Sapp, Corrigan, R. H. Smith, R. V. Smith, Melody, Zinkham, McClellan, Lambert, Gilfillan, Rome, Grubb, Mackie, Horner, Young and Ryan.

E. M. PICKENS.

NECROLOGY

DR. HARRY E. STATES died at Detroit, Mich., Monday afternoon, December 8, 1919, in his forty-ninth year. Death was due to heart disease following a complication of other diseases from which he had been a sufferer for more than a year. About a month before his death he went to the Mayo Clinic at Rochester, Minn., to see whether any treatment other than that already prescribed for him by his own physician would give him any relief. He had returned to Detroit and was looking after his official duties up to the end.

Dr. States was born at Laceyville, Pa., April 6, 1871. He entered the University of Pennsylvania in the fall of 1900 and received his degree in 1903. About that time Frederick Stearns & Co. of Detroit were entering the biological manufacturing field and wanted a veterinarian to take charge of their serum-producing horses. When they wrote to the late Dr. Leonard Pearson, then Dean of the University of Pennsylvania Veterinary Department, he selected Dr. States for the position, which the latter held for about four years.

In 1907 Dr. States accepted a position as veterinarian to the Detroit City Board of Health, and at the time of his death he was one of the oldest employees of the Board of Health in years of continuous service. He had charge of the meat inspection in Detroit, as well as the inspection of the herds supplying certified milk to that city under the direction of the Medical Milk Commission. Dr. States personally supervised the tuberculin testing of these herds, and was exceptionally accurate, painstaking and conscientious in this work. During the late war he had the additional duties of director of the dairy and food department of the Detroit Board of Health when the position was made vacant by Mr. C. H. Chilson entering military service.

Dr. States was an enthusiastic association worker. At the time of his death he was President of the Southeastern Michigan Veterinary Medical Association and also of the Michigan Milk and Dairy Inspectors' Association, in both of which organizations he was a moving spirit. He was a member of the American Veterinary Medical Association, the Michigan State Veterinary Medical Association, the Michigan-Ohio Veterinary Medical Association, the United States Live Stock Sanitary Association and the International Association of Dairy and Milk Inspectors. He was a member of Ionic Lodge No. 474, F. and A. M.

The funeral took place Saturday afternoon, December 13, under Masonic auspices. The services were attended by many members of the profession from Detroit and vicinity. Many beautiful floral offerings were sent in the names of the associations in which the deceased had taken such an active part.

Dr. J. M. Urba of Oklahoma City, Okla., died December 10, 1919. Dr. Urba was a graduate of the McKillip Veterinary College in 1908 and was admitted to membership in the American Veterinary Medical Association in 1917.

MISCELLANEOUS

A TRIP TO THE PACIFIC COAST

IN response to an invitation from the California State Veterinary Association to come to the "Golden State" and assist in holding a short course for the veterinarians of the State, the writer, accompanied by Mrs. Mayo, left Chicago December 21 for the coast. We went out over the Santa Fe partly because there is less snow along the line and partly because it crosses Kansas, our old stamping ground, where 30 years ago we sought out glandered horses and chased the gay and festive cattle tick and mange mite. Once in those long-past days I was rather skeptical as to whether the tick was the real cause of Texas fever, so skeptical in fact that I put some young ticks, hatched from eggs sent me through the mail by Dr. Francis of Texas, upon a Jersey cow I owned. It is unnecessary to add that when I hauled out the cow for "the last sad rites" I had become a convert to the "tick theory." We passed near the old Fort Larned ranch in Southwestern Kansas where I first reported cattle scabies in the United States, so the trip revived many pleasant memories of days of long ago.

Several inches of snow covered the ground when we left Chicago, but in Kansas this had disappeared, although we could see snow in the mountains of New Mexico, Arizona and California. It was a delightful surprise, after crossing the Mojave desert and the Sierra Madre mountains, to literally drop down into the beautiful orange groves of San Bernardino.

We went on at once to San Francisco, reaching there Christmas morning. We spent several very pleasant days in and about San Francisco. Dr. O. J. Kron, who has a fine small-animal hospital and a large practice, gave us a delightful automobile ride, showing

us all over the city. Dr. and Mrs. Haring also entertained us royally. While in San Francisco I called on Dr. R. A. Archibald, ex-President of the A. V. M. A. and member of the Executive Board. Dr. Archibald has been in poor health and confined to his bed for a year, but was showing some improvement at the time of my visit. While he was not able to attend the A. V. M. A. meeting at New Orleans, he takes an unusual interest in the work of the Association, and I was able to give him an account of the interesting meeting in New Orleans. He inquired about his many friends. I hope that all who can will write to Dr. Archibald, for I am sure he would appreciate this very much.

On December 29, under the guidance of Dr. Haring and with a group of veterinarians, we went to the University Farm at Davis, Calif., where the short course was held. At Davis we met Dr. W. J. Lentz of the University of Pennsylvania, who had also come to help with the short course.

I shall not attempt to report the excellent meeting, as someone else promised to do this for THE JOURNAL. Everything went off promptly, and an active interest was taken in the meeting by the 70 veterinarians who attended and stayed the full three days.

While I enjoyed the meeting very much, I am not boosting the climate of Davis. It's wonderful how near one can come to freezing with the thermometer above the freezing point. A dense fog enveloped everything three days we were there, so we did not see the sun. We were assured, however, that the weather was very unusual.

On New Year's Eve we left for Los Angeles, where we were to meet with the southern branch of the California Veterinary Association. When we got off the train at Los Angeles New Year's morning we were met by Dr. and Mrs. Bushong, who took us in their motor directly to Dr. Boucher's residence in Pasadena. Dr. Boucher was assistant marshal of the great Carnival of Roses that was to take place at once, so we did not see him until he rode past in the procession. We all voted him the handsomest man in the parade. As soon as the parade was over we returned to Dr. Boucher's home, where his charming wife kept "open house" and served us a fine lunch, and then away to the park to see the football game between Harvard and the University of Oregon. The "bean eaters" won, 7 to 6, but it surely was "some game."

New Year's night the Southern California branch of the association gathered for an excellent dinner at the Hotel Green, and

a veterinary meeting was also held. The next morning Dr. Boucher took us for a fine ride about the city of Pasadena, showing us the famous Busch Gardens and the interesting old Mission of San Gabriel. In the afternoon a clinic was held at the fine small-animal hospital of Dr. Agnew, at which Dr. Lentz operated and lectured. About 40 veterinarians were present. In the evening another dinner and meeting were held at Hotel Green.

We do not want to indulge in any flattery, but the California veterinarians are a "live bunch," up to date and anxious to keep in the front line of progress. They are royal entertainers and gave us a delightful time, and to them we wish to express our gratitude.

After a few days in the delightful sunshine and among the flowers and orange groves of Southern California we left for Chicago, stopping en route to visit the magnificent Grand Canyon, then back to the cold of Chicago. After all, about the best part of such a delightful three weeks' trip is getting back to the place one calls home.

N. S. MAYO.

A PATRIOTIC VETERINARY FAMILY

THE JOURNAL is pleased to present to its readers a picture of Dr. Frederick William Grenfell, of Washington, D. C., and his three fine-looking sons, all of whom were "across" and all of them severely wounded. Seldom has a family in this world's war suffered a 100 per cent casualty of those engaged.

Dr. Grenfell is the oldest graduate veterinarian practicing in Washington, coming to this city directly after his graduation at the Royal Veterinary College, England, in 1888. He has been a leading practitioner of this city since that date, and at present is Secretary-Treasurer of the District Veterinary Examining Board. The Doctor is the proud father of four sons, the youngest not being eligible for military service on account of his youth.

1st Lt. Frederick A. Grenfell, V. C., on crutches, was the most severely wounded veterinary officer in the A. E. F. He was commissioned June 20, 1917, called to active service July 2, 1917, promoted First Lieutenant March 19, 1918, and went overseas with the 33d Division as Brigade Veterinarian, 65th Infantry Brigade. He was assigned to 18th Field Artillery, June 28, 1917, and was in the second Battle of the Marne and the Aisne-Marne offensive with the 121st Field Artillery. On September 24, 1918, he was assigned to 128th Field Artillery and was wounded October 1 at 1 a. m. at



DR. FREDERICK WILLIAM GRENFELL AND SONS

Charpentry (Argonne) by a high explosive shell, sustaining a compound, comminuted multiple fracture of left tibia and fibula, and deeply burned by mustard gas while lying on the battle field.

Lieut. Grenfell was evacuated to base hospitals at Dijon, Poitiers and Bordeaux, France, and later to Walter Reed General Hospital, Washington, D. C., on February 23, 1919, where he has undergone several very painful operations and is at present under treatment at this hospital. He is a graduate of the College of Veterinary Medicine, George Washington University, and was in the Virus-Serum work of the Bureau of Animal Industry when commissioned.

Wm. Joseph Grenfell, sitting on the edge of his father's chair, was a Corporal in the Signal Corps and was transferred successively to the 30th Engineer Gas and Flame Pioneer Regiment and then to the 38th Engineers, where he was promoted Sergeant. He was knocked off a 65-foot pole August 18, 1918, sustaining a fracture of the second cervical vertebra. He was evacuated to the United States June, 1919, and discharged August 25, 1919, at Walter Reed General Hospital, Washington, D. C.

Carrol Joseph Grenfell, standing in rear of his father, enlisted in the Navy, June 5, 1917, and was discharged on account of physical disability January 17, 1918. He enlisted in the Medical Corps, U. S. Army, April 3, 1918, and went overseas June 24, 1918, with the 145th Infantry. He saw active service in the Argonne offensive and in Belgium. A piece of high explosive shell went through his right thigh, his "bunkie" being killed by the same shell. He was evacuated to the United States and discharged June 29, 1919, at the Walter Reed General Hospital, Washington, D. C.

Dr. and Mrs. Grenfell should be proud of their three fine sons, and the JOURNAL wishes to congratulate these young heroes on their splendid military records.

EXECUTIVE BOARD NOMINEES

As a result of the postal-card vote for nominees for the Executive Board vacancy for the Fourth District, the following selections were made (arranged alphabetically): Houck, Kiernan, Kinsey, McInnes, Musselman, Turner, a tie vote requiring a sixth name. These names are now being presented for a final selection to be announced March 1. May the best man win.

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THE VETERINARIAN'S RELATION TO THE BETTER-SIRES MOVEMENT

TIMES are changing, each year bringing new developments in the number and quality of domestic animals in the United States. These changes are of importance to the veterinary profession. During 1919, according to the latest estimates, there was a slight falling off in the number of horses and some gain in dairy cattle. When any trend of this kind is in the same direction for a number of years the situation becomes one that merits thoughtful consideration by practicing veterinarians.

In recent years there has appeared to be a decreasing demand for the incompetent, commonly termed "horse doctor" and more for veterinarians qualified to apply, for example, the various forms of tuberculin tests. That condition probably is due to developments in motor transportation on the one hand and to increased knowledge of systematically controlling tuberculosis on the other.

There appears also to be a somewhat narrower field for the heavy-fisted practitioner whose specialty is large dosage forcibly administered, and increasing opportunity for men who can diagnose and cure with less medicine and superior knowledge.

SCRUB SIRES OBSOLETE IN UNITED STATES

Within the last year the cost of feed, labor, and other factors affecting live-stock production have directed attention to the need for better-bred animals of all species. To help meet the situation, the Bureau of Animal Industry, cooperating with other Bureaus in the Department, the various States, the press, breeders, and others interested, inaugurated a movement known as the "Better Sires—Better Stock" campaign.

This movement practically declares that scrubs and other inferior sires in all classes of live stock must be banished from farms in the United States, and that purebred sires of good quality must replace the nondescripts. Inferior purebred sires must go along with the scrubs. The campaign, as organized, is essentially a reenforcement of local effort and in no way interferes with initiative by States, counties, and communities in hastening the exit of inferior sires and the advent of good ones.

MANY BENEFITS FOLLOW PUREBRED SIRES

Information developed within 3 months after the campaign began showed that better sires lead rapidly to improved female stock also. It was noteworthy that of all female breeding animals owned by persons enrolled in the better-sires campaign at the end of 1919, 71 per cent were purebred, 26 per cent were grades and crossbreds, and only 3 per cent were scrubs. The percentages of purebred females found in herds and flocks owned by purebred sire users also was noticeably similar for the various classes of animals.

Numerous other deductions are possible from the information collected, but they all point in one general direction. They show that better sires result in herds and flocks which are more profitable to their owners and which benefit the general public likewise through a higher quality of meat and work animals.

TIME TO STAKE OUT NEW BOUNDARIES

With such a situation developing it is an opportune time for the veterinary profession to consider carefully what its attitude toward such a movement shall be. Not long ago the profession was somewhat concerned about the growth of the county-agent system. At various other times discoveries in the field of biological medicine likewise affected the kind and quantity of work that veterinarians were called on to do.

The time apparently is near when the veterinary profession must

**WHICH WAY
IS
YOUR
LIVE STOCK
GOING
?**

PUREBREDS

Let YOUR Animals March With The Purebreds

SCRUB ROUTE

**JOIN
THE
"BETTER Sires
BETTER STOCK"
CAMPAIGN**

**ENROLL AND GET AN OFFICIAL EMBLEM
CONSULT THE COUNTY AGENT, YOUR AGRICULTURAL COLLEGE, OR
THE UNITED STATES DEPARTMENT OF AGRICULTURE**

A Reproduction of a Colored Poster Issued by the United States Department of Agriculture in the Interest of the Better-Sires Movement.

stake out new boundaries. Shall veterinary practice be limited to the diagnosis and treatment of disease, to the handling and administration of biological products, to a certain amount of surgery, and, generally speaking, to the physiological field? Or, shall the scope of work be extended to include an accurate working knowledge of the principles of animal breeding as well as feeding and assistance to live-stock owners in the various problems which arise in handling finely bred stock—problems which occur less frequently among average farm animals? The one field is narrow and the other broad; and in considering the decision, it is well to decide whether the veterinary profession shall be only a casual onlooker or whether it shall take a definite and active part in the better-sires movement.

BREEDING ADVANCEMENT BRINGS ADDED VETERINARY DUTIES

Let us consider briefly some of the points where activities of the veterinary profession come into contact with those of live-stock breeders.

Sterility and irregular breeding are matters in which a trained veterinarian can be of service. Failure of valuable animals to breed regularly is a more serious condition than deficiency of inferior stock in this respect.

Control of internal and external parasites and pests of various kinds becomes gradually more important as stock increases in value. A \$500 animal justifies attention that is less likely to be given a \$50 "critter."

Abundant experience shows that the health of a valuable herd is guarded more zealously than that of a bunch of scrubs. This principle includes the tuberculin testing of cattle, immunization of swine, and other similar veterinary practices.

There is more likely to be a demand for careful autopsies of valuable animals which die from unknown causes.

The use of purebred sires, and especially the business of raising purebreds of both sexes, results in the considerable movement of stock into and out of a community. This movement involves the necessity for certifying to the health of animals, in many cases, as a safeguard in preventing spread of disease.

The presence, in a community, of well-bred herds and flocks indicates intelligence and skill on the part of their owners. Such a community should offer a more attractive practice to qualified veterinarians than neighborhoods where inferior animals, crude home remedies, and lack of progress and prosperity are the rule.

In most cases the men who are on the firing line actively conducting the drive against inferior sires are county agents. The work is a logical county-agent activity involving education, surveys, and meetings—all of them excellent means for getting results. More than that, the introduction of purebred sires brings lasting benefits; a good sire used this year means better offspring for decades to come. When breeding stock is properly handled, the improvement in offspring is progressive and perennial.

Alert county agents know these facts and in live-stock communities they are devoting much time to better-sires work. Such a situation is not displeasing to veterinarians who, observing the work of some county agents at close range, have regarded them as competitors in community service. That feeling has been strongest perhaps when county agents have staged extensive demonstrations in the inoculation of swine against cholera.

OPPORTUNITY FOR TEAMWORK

Thus in the "Better Sires—Better Stock" campaign there is promise of balm for irritations of the past and abundant opportunity for county agents and veterinarians to work together. The county agent's field in this work is principally that of bringing about the use of purebred sires, while the veterinarian with his professional skill helps the breeder safeguard the valuable herds and flocks developed. Members of the veterinary profession who are not already familiar with the principles by which type, coat color, absence of horns, and various other characteristics are transmitted may well inform themselves of these matters. Breeding as well as feeding problems are closely related to the vital processes already a part of veterinary study.

WINNING THE CONFIDENCE OF A COMMUNITY

In addition to the purely professional side of the matter, another side of greater importance must not be overlooked. Breeders are becoming better and better informed. What shall be their estimate of a veterinarian who is unable to advise them properly on certain semiveterinary matters that relate to breeding? I have in mind such topics as herd sanitation, artificial impregnation, and frequency of service. These subjects may be considered on the borderland between the fields of breeding and of veterinary practice, but every veterinarian should be at least as fully informed as the breeder whom he attempts to advise.

Failure in this respect may result in a general loss of confidence

on the part of the breeder, who concludes that if his veterinarian is not abreast of the times in such matters he is behind in other branches of the profession also.

So, from the business side, the professional side, and for psychological reasons, the better-sires movement with all its ramifications merits careful attention by the veterinary profession. The movement promises beneficial and far-reaching results, and the profession may wisely hitch the veterinary wagon to this star.

THE SOUTHERN VETERINARIAN

THE veterinarian of the South is rather of a new type and acutely represents the product of the modern school. His splendid training is adequate to meet all the requirements, which make it possible for his ethics and principles to dominate his field of action. Now and then an empiric may be encountered, but they are so scarce that they have been unable to permeate the atmosphere of veterinary medicine with a domineering spirit of charlatanism. Conversely, the practitioner's *clientele*, to a large extent, is free from the toxic effects of quackery.

The A. V. M. A. has extended its mighty arm of influence to the Gulf of Mexico and, in turn, received a cordial welcome which has produced two powerful results; notably, an increased number in the membership of the Association, and the elucidation of the advantages of spreading to the people the gospel of clear, definite thought along the channels of comparative medicine. This propaganda is doing a tremendous work and gaining a prestige for the profession throughout America which will remain indelibly engraved through the changes of time. The southern veterinarian is contributing his share toward the victory. He has sincerity of purpose; that is, to serve a just and compelling cause at a reasonable compensation. His attitude and behavior as a veterinary medical man rings true and his desire for expansion, in all branches of the calling, is equal to the majority. He measures up to every requirement and his achievements are a crowning event in the history of veterinary education.

E. I. S.

SERUM THAT SAVED HUMAN LIFE MADE FROM SHEEP'S BLOOD

THE serum that saved the life of a little girl, after the other six members of her family had died from eating poisonous olives in

New York, was made in the Bureau of Animal Industry from the blood of a sheep that had been immunized against bacillus botulinus poisoning. The serum was rushed to New York by the Bureau on request from the United States Public Health Service. Three members of the family were alive when the request was made, but one of these died before the serum reached New York and another was so nearly dead that treatment was unavailing. The little girl was the only one with sufficient vitality left to make possible a test of the efficacy of the serum.

The Bureau happened to have the life-saving serum because of the fact that the bacillus botulinus has been suspected of causing forage poisoning of horses. In investigating that subject the veterinarians of the Bureau made extensive experiments with serums. It was discovered that there are two strains of the bacillus botulinus. They look alike and the poisons they create produce the same effect, but immunization against one does not afford immunization against the other. The two strains are commonly referred to around the Bureau as "the olive strain" and "the cheese strain," or sometimes as "strain A" and "strain B."

The three recent instances of olive poisoning—one in Michigan, one in Ohio, and the third in Montana—were all caused by "the olive strain" or "strain A" of the bacillus botulinus. The veterinarians, therefore, were reasonably certain that the serum affording protection against the poison generated by "strain A" botulinus would be effective in the New York cases, and it proved to be so in the one case where it could be given a fair trial.

A NEW VETERINARY PERIODICAL

A new veterinary journal is to be published in Chicago under the name of *The North American Veterinarian*. Doctor J. V. La Croix is to be the managing editor. Doctor La Croix was formerly associated with the *American Journal of Veterinary Medicine* and is well qualified to edit a veterinary periodical. The JOURNAL wishes him unbounded success in his new venture and a long life for *The North American Veterinarian*.

MALIGNANT CATARRHAL FEVER¹

By C. J. MARSHALL, T. E. MUNCE, M. F. BARNES
and FRED BOERNER

Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.

DURING December of last year, a disease occurred in a herd of dairy cattle which was later diagnosed as malignant catarrhal fever. The disease is uncommon in this section of country. For this reason arrangements were made between the owner and the State Bureau of Animal Industry for careful and rather exhaustive study of it.

The farm upon which the disease occurred is located on the historic Brandywine in Chester County, which is one of the most fertile sections of Pennsylvania. The land is rolling and well drained. The buildings are stone and concrete. The stable is in the basement of a large combination farm barn with cement floors and mangers. The drainage, light and ventilation are excellent. The drinking water is of good quality from a spring which is located on the hillside opposite the dairy and piped a distance of one-quarter of a mile. The cattle were receiving ensilage, Arcadia dairy feed, bran, gluten, oat, clover and timothy hay, all of which were considered of good quality.

Conditions in general at this farm are most excellent. It is recognized as one of the very best arranged, equipped and managed dairies in the East. It is the last farm upon which one would expect to find malignant catarrhal fever, as this disease, according to most writers, appears in insanitary barns and badly managed herds.

The owner had two other farms several miles distant. The disease did not appear on these farms, although the cattle were handled and kept under similar conditions.

The only cattle introduced came from a healthy herd in the immediate vicinity two months prior to the outbreak.

HISTORY

About the middle of December a cow and a heifer were taken sick. The attending veterinarian was promptly called and diagnosed the trouble as probably hemorrhagic septicemia, a disease which was rather common in his territory. He reported the condition to the Pennsylvania Bureau of Animal Industry. The cow died and

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

necropsy indicated hemorrhagic septicemia and the whole herd was promptly vaccinated. The heifer, case 2, died December 24 and was disposed of without a necropsy.

On December 26 a 3-year-old cow (case 3) was taken sick, and the following day a 2-year-old heifer (case 4) showed symptoms. When these cases developed it was believed to be a virulent outbreak of hemorrhagic septicemia, that the first vaccination had not produced sufficient immunity and that a revaccination would be advisable. This was done December 27.

Case 3 died December 30, and the necropsy showed lesions similar to case 1. The lesions found in case 4 were characteristic of hemorrhagic septicemia, and a subsequent bacteriological examination revealed the presence of *Bacillus bovissepticus* in the tracheal exudate. The fact was not overlooked that the presence of these organisms might have been the result of vaccination with a living vaccine, or possibly existing as a saprophyte on the membrane of the upper respiratory tract, as they were not demonstrated in any of the internal organs.

On January 2 a 4-year-old cow (case 5) and two days later case 6 became sick. On the 7th case 5 and on the 9th case 6 died. The latter had been treated with anti-hemorrhagic-septicemia serum as soon as the symptoms appeared.

On January 8 case 6, which had been sick for several days, was very weak, showed a temperature of 106° F., and died the following day. The remainder of the herd appeared normal.

The cases did not develop in any particular section of the stable or group of animals. Case 6 had received in addition to prophylactic vaccination four injections of hemorrhagic septicemia serum, a total of 350 c.c. The symptoms, course and necropsy findings of all cases thus far showed a striking similarity. The absence of pneumonia and the presence of enteritis in all cases led us to suspect mycotic enteritis.

The ensilage was considered as a possible causative factor and was discontinued January 1. The disease abated for a few days, but on January 17 cases 7 and 8 developed.

The cattle from then on received mixed hay, chopped mangels and ensilage and were bedded on corn fodder, some of which they ate. The concentrated feed consisted of a mixture of Arcadia dairy feed, 500 pounds; ground oats, 500 pounds; cottonseed meal, 100 pounds. Each animal received from 2 to 16 quarts per day. Those not milking (heifers and dry cows) received the minimum amount.

On January 19 all remaining animals were again given hemorrhagic septicemia vaccine. From January 17 to February 9 no new cases developed and it was thought that the outbreak had stopped. On the latter date, however, cases 9 and 10 developed. They showed symptoms similar to those of the preceding cases.

The herd was again vaccinated. The bacteriological examinations to date were not conclusive, yet in a few cases the *Bacillus bovisepiticus* was demonstrated. The chemical analysis of feeds and organs failed to reveal evidence of poison. The symptoms and autopsy findings were suggestive of three infectious diseases, viz., hemorrhagic septicemia, malignant catarrhal fever, and rinderpest.

On account of the difficulty in getting to and from the farm it was decided to have the next few cases sent to the State Laboratory at the Veterinary School of the University of Pennsylvania for observation. It was also decided to inoculate cattle to determine if the disease could be transmitted artificially. On February 15 a cow and her calf were inoculated with material from case 10. Both were injected subcutaneously with 5 c.c. of emulsion of heart's blood, spleen and lymph glands, and also fed an emulsion of pseudo-membrane from upper respiratory tract. The results of this experiment were negative.

On February 17 case 11 developed symptoms and was brought to the Laboratory for observation. This animal died six days later. The necropsy findings and laboratory examinations failed to furnish any definite information other than the presence of the *Bacillus bovisepiticus* on the mucous membrane of the upper respiratory tract.

Not being fully convinced that the disease was not hemorrhagic septicemia, it was decided to vaccinate the herd with a vaccine prepared from the strains of *B. bovisepiticus* isolated from these cases. The herd was first vaccinated with a bacterin and later injected with a living vaccine prepared from these cultures. Cases continued to develop in spite of the fact that the animals had repeatedly been vaccinated against hemorrhagic septicemia.

On April 13 Dr. V. A. Moore of Cornell was called in consultation. He examined a number of cases and witnessed an autopsy. From the history of the outbreak and the symptoms and lesions found it was suggested that the disease was probably malignant catarrhal fever. Working on this basis, we were soon confronted with the development of new cases that manifested a more typical picture of the latter disease.

About the middle of May the herd was turned out but returned to the stable each day for milking. One more case developed soon after the animals were on pasture. A shed was built for milking purposes and made use of about June 1, thus eliminating exposure to stable infection.

On June 24 another case, the last, developed, but as little is known of the incubative stage it is supposed that it contracted the disease in the stable prior to June 1.

Table 1 shows the number of new cases that developed each month from the middle of December, 1918, to July 1, 1919:

TABLE 1.—*Development of Cases by Months*

	<i>Cases developed</i>
December, 1918 (half month).....	4
January, 1919.....	4
February, 1919.....	5
March, 1919.....	6
April, 1919.....	8
May, 1919.....	3
June, 1919.....	1

SYMPTOMS

The disease was ushered in by loss of appetite, high temperature and nervousness or dullness. Some female animals showed signs of estrum at the beginning of the disease, which may have been only a coincidence. The appetite for water was increased. Milk secretion was rapidly decreased. In the majority of cases the mucous membrane of the eyes, nose, mouth and even the vulva were highly congested. Quivering and twitching of the various groups of muscles of the body, also an uneven distribution of body temperature, were observed. Extensive salivation and lachrymation with a nasal discharge of a clear, glassy-like, watery material were prominent symptoms. The secretions usually were not pronounced until the second day. After several days they became muco-purulent. The nasal discharge in most cases was brownish red to blood colored and of an offensive odor. The submaxillary region in a few instances was edematously swollen. The sick animal was uneasy and irritable and sensitive to palpation over various regions of the body, especially along the back and loins.

The muzzle was dry and hot and after three or four days cracked and assumed a checkered appearance. In cases that extended beyond this time large pieces of epiderm appeared as loose scabs on the muzzle, and the longer the course the looser the scab became,

until in about ten or twelve days it was entirely peeled off and the end of the muzzle presented a red, raw surface.

There was conjunctivitis accompanied by swelling of the lids and lachrymation which became more noticeable after the second or third day, and the discharge continued running down the cheeks during the remainder of the course of the disease. The lids were often swollen to three or four times their normal thickness and the eyes showed a half-closed appearance. The cornea usually remained clear until after the disease had progressed several days. In some cases it was hazy and later became completely clouded.

The labial mucous membranes were much reddened and usually showed from small erosions to deep cracks and in a few more prolonged cases distinct ulceration in the gangivo-labial commissure. In no case was a loosening of the horns observed.

The hair was quite lusterless in the beginning, and in prolonged cases rapid shedding was noticed. The skin was dry and scaly and later showed signs of peeling off. In chronic cases scabs were found on the skin of the infracervical and scapular regions, the medial surface of the thighs, udder and the intra-abdominal region. These scabs measured about $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter, and when picked off a yellowish, slightly blood-colored serum was seen at their base.

The type of breathing was usually irregular and painful. In the more acute cases the respiratory movements of the costal walls were almost unrecognizable and were replaced by a shaking, jerking, trembling movement, and it was almost impossible to determine whether the animal was trying to inspire or expire. Auscultation revealed from nothing abnormal to gurgling, rattling, cracking and whistling sounds. Snoring was sometimes heard.

Constipation in many cases was observed as one of the first symptoms, and was often followed by a diarrhea which usually developed about the second or third day and continued until death. Some animals remained more or less constipated to the very end and a few showed tenesmus. Others developed a diarrhea at the beginning which usually continued. In some cases blood was passed with the feces.

The vulvar mucous membrane was generally reddened in the early stages and later became more or less necrotic and peeled off.

Few showed frequent urination of small amounts of slightly reddish urine. In others the amount and frequency were apparently normal, but the urine usually showed a reddish tint.

Emaciation was marked in all cases.

The temperature varied in accordance with the acuteness of the disease. A rise in temperature was among the first symptoms noted and usually reached about 106 or 107° F. at the end of the first, second or third day and in the acute cases remained high until shortly before death.

The pulse was increased in frequency at the beginning. The rapidity in acute cases ran as high as 100 or more per minute.

Analysis of the urine from four animals during the middle to the latter course of the disease revealed a distinct acid reaction, large amounts of albumen, numerous casts and a few bacteria. Blood was present in the urine in three or four cases and indican was found in two of them. The specific gravity ranged from 1010 to 1025. Sugar and acetone were not present.

Blood samples from these same animals showed an average count of about $4\frac{1}{2}$ millions of red blood cells and about 10,000 white blood cells, average hemoglobin about 40 per cent. There was apparently a decrease of red blood cells and an increase of white blood cells as the disease progressed. A differential count of the white cells showed approximately 40 per cent lymphocytes, 13.5 per cent mononuclears, 42 per cent polymorphonuclears, and 3.5 per cent eosinophiles.

Table 2 shows the temperatures, pulse and respirations of a few cases.

COURSE AND PROGNOSIS

The 23 cases as outlined in Chart 1 for which accurate records were kept ran a course of from 2 to 18 days with an average of approximately $6\frac{1}{4}$ days. The course of the disease was generally acute. All affected animals died.

ANATOMICAL CHANGES

The anatomical changes varied according to the duration and localization of the disease. The most constant findings were inflammatory changes of all the mucous membranes, those of the upper respiratory tract being the most characteristic and constantly affected.

The nostrils, eyes and skin manifested changes which were recognized during life and which have been discussed under symptoms.

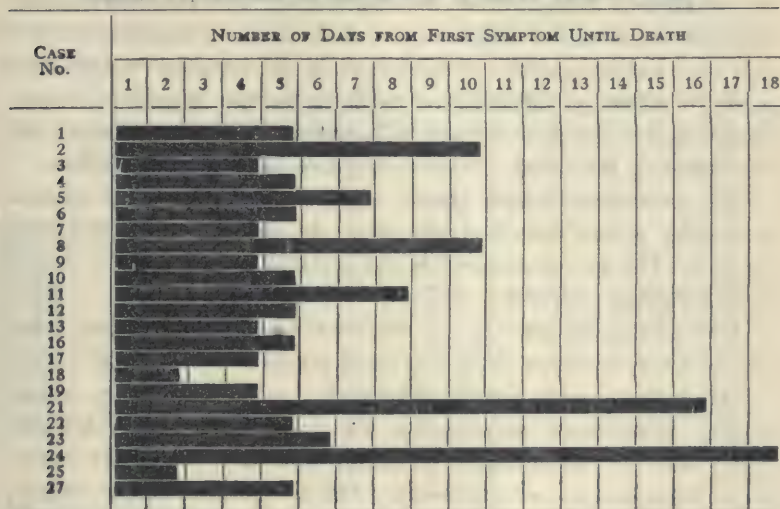
The mucous membrane of the nose was bright red in color, petechiæ were often present, and frequently showed a muco-purulent discharge. In one animal two large ulcerative surfaces covered with

TABLE 2.—TEMPERATURE, PULSE AND RESPIRATION.

CASE No.	ITEM	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day	11th day	12th day	13th day	14th day	15th day	16th day	17th day
11	Temperature.....	105.3	105.5	106.0	106.1	105.0	106.4	103.4	Dead									
	Pulse.....	70	96	96	120	84	100	90										
	Respiration.....	40	54	40	44	48	40	24										
17	Temperature.....	105.4	107.0	107.4	Dead													
	Pulse.....	50	52	64														
	Respiration.....	58	56	48														
21	Temperature.....	106.3	106.4	106.1	105.6	106.0	106.0	105.0	105.0	105.0	104.5	104.5	104.8	104.4	104.4	104.4	103.1	Dead
	Pulse.....	68	68	75	66	72	87	90	90	90	90	90	102	102	98	120		
	Respiration.....	36	38	36	26	22	26	30	25	24	24	24	22	22	24	30		
22	Temperature.....	107.1	106.0	105.0	104.5	Dead												
	Pulse.....	52	54	88														
	Respiration.....	27	27	24														
23	Temperature.....	104.3	106.0	106.7	106.2	103.4	Dead											
	Pulse.....	44	50	80	80	30												
	Respiration.....	28	40	30	36													
24	Temperature.....	105.1	106.1	106.2	102.0	102.2		103.5	104.0	104.2	104.3	104.3	103.8	103.0	103.0	103.2	103.1	103*
	Pulse.....	42	52	96	96	87		108	104	100	96	102	90	103	103	66	76	90
	Respiration.....	20	26	20	20	30		26	27	24	23	22	20	22	16	15	24	24

*Died on 18th day.

CHART 1.—COURSE OF DISEASE IN TWENTY-THREE CASES.



a diphtheritic material were present and on each side of the anterior extremity of the nasal septum. The sinuses in a few cases showed slight injection of the vessels but no collection of pus or inflammatory exudate. The ethmoid and turbinate bones and the horn cores showed no inflammatory changes.

In the more acute cases the mucous membrane of the pharynx, larynx, trachea and bronchi showed catarrhal inflammation which occasionally became croupy and diphtheritic. Usually small erosions were present which varied in size from a pin-head to a dime. In some instances they were covered with a croupy or diphtheritic exudate. In one case the croupous exudate covered the trachea to its bifurcation, while in others only the pharynx and larynx were affected. Petechial hemorrhages of the membrane were common. Ulceration of the larynx with a diphtheritic deposit was observed in one case. The lungs were hyperemic and usually showed acute edema and interstitial emphysema. The mediastinal and bronchial lymph glands occasionally were acutely swollen and hemorrhagic. Sub-epicardial and endocardial hemorrhages and albuminous degeneration of the myocardium were often present.

The mucous membrane of the oral cavity in the early stages was of a pink to reddish color, particularly the gingiva and the ends of the papillæ. In some of the less acute cases superficial erosions, especially over the soft and hard palate and on the sides and frenum of the tongue, were present. Sometimes the erosions were present

on the mucous membrane of the esophagus. The abomasum generally showed catarrhal inflammation of the mucous membrane and in one case was ulcerative. The changes in the intestines varied from a simple catarrhal inflammation with or without superficial hemorrhages to a severe hemorrhagic inflammation with hemorrhages into the lumen of the canal. Solitary follicles were usually swollen.

The mesenteric lymph glands were acutely swollen in animals indicating severe intestinal changes. In others no changes were noticed. The glands situated in the cervical region usually showed acute swelling and edema and some were hemorrhagic.

Albuminous degeneration of the liver was a very constant lesion and in a few instances there was focal necrosis of this organ.

The kidneys were usually hyperemic and occasionally hemorrhagic. Albuminous degeneration was constant. The urethra generally showed inflammatory reddening and in a few cases punctiform hemorrhages were present. The membrane of the urinary bladder showed some changes, ranging from a slight catarrhal to a hemorrhagic inflammation, with marked thickening. The spleen occasionally showed moderate acute swelling.

Fresh hemorrhages in the subcutaneous and subserous connective tissues were often present.

ETIOLOGY

A careful bacteriological study of many cases revealed nothing of etiological importance. In a few cases bacilli of the hemorrhagic septicemia group were isolated from the upper respiratory tract, buccal mucous membrane and in one case from the heart's blood. It is probable that they were present as saprophytes or secondary invaders.

A number of experiments were carried out for the purpose of determining, if possible, whether the disease could be transmitted to other animals. Subcutaneous and intravenous injections were made of heart's blood and emulsion of tissue. Secretions and excretions from affected cattle were fed to healthy cattle; healthy stock were exposed to natural infection by keeping them in contact with affected animals. All these efforts gave negative results. In no instance was it possible to produce the clinical symptoms exhibited by the animals on the infected farm.

SUSCEPTIBILITY

Table 3 shows the number of animals of the different ages that died, the number remaining, the total number of the different ages

and the percentage of deaths for the different ages. Calves that have been born since the beginning of this outbreak are not included in this table:

TABLE 3.—STATISTICS OF DEATHS BY AGES.

AGE	NUMBER DEAD	NUMBER REMAINING	TOTAL	PER CENT DEATHS
Under 1 year	—	2	2	00.00
Under 1 year	5	4	9	55.55
Under 2 years	7	4	11	63.63
Under 3 years	8	5	13	61.53
Under 4 years	8	4	12	66.66
Under 5 years	1	5	6	16.66
Under 6 years	—	3	3	—
Under 7 years	—	1	1	—
Under 8 years	—	1	1	—
Age not given	2	1	3	66.66
Total	31	30	61.	50.81.

The animals most susceptible were those over 2 and under 5 years of age.

Several calves dropped during the outbreak did not become sick. Some were sucking their mothers at the time they were taken sick. One calf was purposely left with its mother until her death and it remained healthy.

There were no data to show whether male animals were more susceptible than females. There was only one male animal, a 2-year-old bull, in the herd. It died of the disease.

During a period of about 6½ months, from the middle of December, 1918, to July 1, 1919, slightly over 50 per cent of the herd of 61 animals died of this disease. They were apparently susceptible to infection during the winter, spring and part of the summer. The last winter having been rather mild may account to some extent for the continuance of the disease.

Most all the animals of this herd were in good physical condition before they became sick. Several breeds were represented. There were several purebreds and a number of grades. Whether the cow was dry, a heavy springer, or fresh, seemed to play no important part.

Sheep and swine were kept in adjacent buildings and cared for by the same attendants but escaped the disease.

Exposure to cold, debility and insanitary conditions are generally accepted as predisposing causes. Each of them were conspicuously eliminated in this outbreak.

TREATMENT

The treatment, both medicinal and biological, failed to check or alter the course of the disease. The premises were frequently cleaned and disinfected.

The disease may be more prevalent than is generally supposed. A diagnosis in this case would have been overlooked if the disease had occurred in a small herd with but few deaths.

Up to the present time there appears to be no cause for the disease and no prevention or cure for it.

We desire to acknowledge our appreciation to Drs. Benjamin Price and D. E. Hickman, of West Chester, for their valuable assistance, also to Capt. R. A. Kelser and Dr. E. W. Price for their help in the Laboratory.

GOVERNMENT STALLION WINS

TROUBADOUR of Willowmoor, 6459, the Morgan stallion at the head of the Government breeding work at the Morgan Horse Farm, Middlebury, Vt., won over all Morgan sires exhibited at the 1919 International Live Stock Exposition. In a class of nine entries Troubadour of Willowmoor was first, Sir Ethan Allen was second, and Ajax was third. Troubadour is a solid bay in color—is nine years old, and was selected by specialists of the Bureau of Animal Industry as a yearling. He has been maintained and developed at the Morgan Horse Farm, where he has been used in military remount breeding service as well as for improvement of the registered Morgans.

Troubadour of Willowmoor weighs 1,200 pounds and stands 15½ hands high. He is a son of Troubadour, by Jubilee de Jarnette, a purebred Morgan. His dam was Fannie 2d, a well-formed type mare of the breed.

SANITARY PRODUCTION AND HANDLING OF MILK¹

By F. J. CAMBON, New Orleans, La.

Milk is often stated to be a perfect food. By this I mean that it contains all the essential elements for normal human growth and development. To produce such a valuable article of food we must depend upon the knowledge of several classes of workers—the veterinarian, the chemist, the bacteriologist, the sanitarian, the pathologist, the research worker, and the dairyman, but the standards in the last analysis must harmonize with and satisfy the needs of the consumer.

There is no topic engaging the serious attention of sanitarians, the civilized world over, more than milk inspection, with the view of securing for the people a sound, nutritive and wholesome supply of this important article of food which figures so largely in the health, the development and the very existence of the race. The susceptibility of milk to the many and varied changes and the many possibilities of its contamination renders a careful method of production and handling of vital importance. In producing and maintaining a safe and sanitary milk supply for a city of the size of New Orleans, or any other city for that matter, certain definite requirements as to production must be maintained, and cleanly methods of handling, refrigerating, transporting and delivering are essential. These problems can not be solved by the layman; they require experience, business sagacity, medical assistance and skill, all working toward a common end.

The strong tendency nowadays in business, governmental and medical questions is to deal with things of the future in order to avert trouble rather than to solve problems under the stress of conditions. The veterinarian who, by his skill in diagnosis and sanitary control, prevents the outbreak of a serious infectious disease is worth a dozen, however skilled they may be, after the disease has become an epidemic. If this reasoning is sane the milk question naturally falls under the surveillance of preventive medicine, and the three watchwords are health, cleanliness and temperature, and an abundance of pure water.

The maintenance of a healthy herd is the most potent factor in a sanitary milk supply. The herd should be under the surveillance of a skilled veterinarian, and any animals suffering from

¹ Paper presented at the Fifty-sixth Annual Meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

diseased udders, general constitutional disease or disorders of any kind that will in any way harm the milk should be segregated from the milking herd and treated, killed or disposed of as the case demands. The herd must be rendered tuberculosis free by the proper application of the tuberculin test; new animals not to be admitted to the herd until after passing a tuberculin test made in accordance with the United States Government's rules; and immediately following the tuberculin test, the cow stables and exercising yards are to be disinfected. A second tuberculin test should follow each primary test after six months. Thereafter the herd should be tested annually. The veterinarian by virtue of his training and varied experience in sanitation is the proper individual to watch over the health of the herd.

The attendants should be free from disease of all kinds, for, owing to its susceptibility to contamination, and being an ideal culture medium, milk is often rendered a disease-carrying medium while the vendors of such milk are innocent of any contamination with human disease-producing organisms. To this end a thorough and systematic medical inspection of dairymen, their families and employees should be maintained by all milk producers in order that they may protect their customers and themselves as much as possible. When illness of a suspicious nature occurs such employee should be quarantined and removed from the premises. These medical inspections should be made at least twice a month.

Milk should be drawn from the cow at regular intervals into clean pails, preferably of the narrow-top design. From a bacteriologic standpoint this is the most important stage in the production of clean milk. Excessive numbers of bacteria indicate the presence of foreign matter—filth and dirt. Milk that is drawn into an open pail from cows whose udders, flanks and hips are loaded with dirt and stable filth must from the very nature of the process of milking be heavily laden with organisms of an undesirable nature. Therefore clean cows, clean barn, clean, healthy milkers with clean, dry hands, and clean pails, are prerequisites to clean milk.

Next in importance to clean milking is the proper cooling. This should be done immediately after the milk is drawn from the cow, inside a clean milk house situated within clean surroundings. The time is past when the dairyman can satisfactorily cool milk without the use of ice. The milk should be cooled to 50° F. immediately after milking and kept at this temperature until delivered.

Clean, sanitary milk therefore can be obtained if the cows are

clean and kept in clean surroundings, providing the persons caring for them and doing the milking are clean in their habits and personal appearance. This requires careful daily routine. The stables should be well lighted and ventilated, whitewashed at least twice a year, have tight, sound floors with gutters of nonabsorbent material; they should be cleaned and swept daily. The udders, flanks and hips of the cow may be clipped and the tails trimmed up and the bush corded out; this will aid materially in keeping the cows clean, and when these parts are wiped off with a damp cloth just before milking many fine particles of dirt and large numbers of bacteria are prevented from falling into the pail. The milkers should milk with clean, dry hands and wear a suit used for milking only. The fact that milk is such a delicate article of food, so susceptible to change and an ideal culture medium should control all methods of production. The bottling, whether done at the dairy, bottling plant or milk station, in order to handle milk in a sanitary manner should be so constructed as to have different rooms or apartments for different kinds of work. There should be a boiler and pump room, containing boilers, engines and pumps that will furnish an ample supply of pure water, steam at 80 pounds pressure and power for running the various machinery throughout the plant; a receiving room where the milk is received, inspected as to odor, taste, temperature and physical appearance of the fluid, and weighed, and where the farmers' cans are rinsed in cold water, washed and steamed; a storage room; a clarifying and bottling room, and finally ice houses containing an ample supply of safe ice, which is used in crushed form around the bottles which are packed in cases and transported to their destination in refrigerator cars.

It has long been recognized that the only safe way to serve milk to a customer is in the original sealed package bottled in the country, direct from the dairy, under conditions which from a sanitary standpoint can not be duplicated in a large city. Surely there can be no more unfit, dangerous or disgusting methods of serving the public with milk than by filling the bottles from cans on the street while in transit where it is subject to dirt, flies and other accidental and vicious causes of contamination. The importance of clean containers in vending clean milk is far more reaching. These bottles should be washed, rinsed, sterilized and kept covered in this sterilizer until they are to be used. To the consumer this feature should be vital, for greater danger lurks in dirty bottles than in dirty milk.

Now let us consider for a moment the consumer's part in the

sanitary handling of milk. Assuming that this bottle of milk is clean and cold, he has certain duties to perform for the protection of the health of his household. A clean, cold place should be provided where it will not be exposed to the heat of the sun or subject to the licking of every stray dog and cat. The cap should be kept in the bottles as long as any of its contents remain unused, and when empty the bottle should be washed first in cold water and then scalded. It is a deplorable fact that too few people treat the milk bottle as a dish in every-day use on their dinner table containing a very delicate and sensitive food. To this end some cities have passed ordinances making it a misdemeanor for the consumer to return dirty bottles to the distributor. The education of the consumer along these lines by boards of health through bulletins, the schools and public press seems to me to be of vital importance.

It is proper that every city should adopt practical, prudent methods in an attempt to protect its food supply, with due regard for all parties, whether it be for the grower of meats or the producer of dairy products or the manufacturer of any edible food. However, the authorities should not overlook the importance of safeguarding the producer's end from the transmission of unclean containers to the source of supply, for the dairymen are not always responsible for some of the troubles that are said to be brought to the home in milk. Therefore, cooperation on the part of the consumer on the one end and the producer and distributor on the other will make a complete and strong daily chain in the sanitary handling of commercial milk.

The foundation of the dairy business lies in the producer; its success in the education of the producer and consumer alike. Give the producer a knowledge of the right methods in producing, handling and caring for the milk, and he will in turn seek information relative to the best means to accomplish this end. Owing to the fact that the production of milk is a confining occupation and requires careful attention to a large number of details twice every day, Sundays and holidays included, from one year's end to another, we should not expect to revolutionize the entire business immediately, but by working carefully, step by step, educating the producer in clean, safe milk. A high price does not necessarily mean clean milk, but clean milk means an increased cost of production.

In this advanced age we are face to face with the revelations of science on the one hand and nature's practical problems on the other. You hear some say that the country has gone bacteria crazy;

even the children on the street are talking about bacteria. This marks the advancement that is being made in general education in the fundamentals of scientific knowledge, and will in time eliminate many erroneous and distorted ideas in these important every-day scientific questions. The American people are not satisfied to pass step by step from the present condition to the ideal, but they must reach the ideal by a single jump, which from a practical standpoint is not a success. Reaching the desired goal through the natural channels and gradual evolution of education and development is more conducive to healthy, businesslike and permanent growth than through the application of spontaneous theories and fancies. Let our united efforts in this great work be toward product even though we may differ slightly in methods and details. Therefore, careful conservation work along practical scientific lines, together with education and cooperation of all parties concerned, is bound to work together for the good of public health and humanity.

NEW MEMBER OF EXECUTIVE BOARD

The committee appointed by President Cary, consisting of Drs. L. E. Day, H. R. Ryder and George Frost, to count the ballots cast at the recent election to fill the vacancy on the Executive Board from the Fourth District, report the result as follows:

Total votes cast, 197, of which Dr. Kiernan received 63, Dr. Houck 44, Dr. Musselman 30, Dr. Turner 30, Dr. McInnes 16, and Dr. Kinsey 14.

Dr. J. A. Kiernan of Washington, D. C., was thereupon declared elected.

BACTERIOLOGIC STUDIES OF A PERACUTE DISEASE OF HORSES AND MULES

By ROBERT GRAHAM, *Captain, V. C.*; FRANCOIS H. K. REYNOLDS,
First Lieutenant, V. C., and DR. J. F. HILL, *Contract*
Surgeon, U. S. Army

(Continued from the February number)

CULTURAL CHARACTERISTICS

The designations and origins of the cultures studied were as follows:

Culture	Origin
Gärtner RV.....	Rabbit inoculated with splenic tissue, stock yards.
Gärtner 104-B.....	Spleen of Mule B inoculated with RV.
Gärtner Sp. 2.....	Rat inoculated with spleen 93.
Gärtner No. 1.....	Stock, S. E. Department Laboratory.
Gärtner 234.....	Stock, University of Chicago.
Gärtner QMC.....	Quartermaster Stable, McPherson.

Strains from Equine Sporadic Cases.

Gärtner 92.....	Spleen.
Gärtner 93.....	Spleen.
Gärtner 94.....	Spleen.
Gärtner 107.....	Spleen.
Gärtner 132.....	Heart blood and kidney.
Gärtner 139 and 141.....	Kidney and axillary vein.
Gärtner 147.....	Spleen and liver.
Gärtner 170.....	Kidney, liver, spleen, mesenteric gland.

Cultures from Natural Sources.

Gärtner QMC.....	Quartermaster Stable, McPherson.
Gärtner H-35.....	Dr. Burkland's stables.
Gärtner H-215.....	Feeding pens, fences, stock yards.

Experiment Cases.

Gärtner, Mule B.....	Inoculated with strain RV, Experiment 1.
Gärtner, Mule C.....	Inoculated strain RV, Experiment 2.
Gärtner, Mule E.....	RV. (culturally positive, serologically negative).
Gärtner, Horse P.....	Inoculated strain, QMC., Experiment 5.
Gärtner, Horse S.....	Inoculated, Gärtner No. 1, Experiment 7.
Gärtner, Mule T.....	Inoculated 104-B, Experiment 7.
Gärtner, Horse U.....	Inoculated QMC., Experiment 7.
Paracolon P. D.....	Horse W, Experiment 7.
Paratyphoid B.....	Horse X, Experiment 7.

The cultural characteristics of the various organisms and strains are shown in Table 16.



A SPONTANEOUS CASE OF THE DISEASE

TABLE 16.—FERMENTATION REACTIONS.

(Key to symbols: Agglutinations, positive +, negative —. Reactions: A = acid; B = acid and coagulation; C = acid, coagulation and gas; D = slightly acid; E = unchanged; F = slightly alkaline; G = alkaline.)

Cultures from Extraneous Sources.

CULTURE	RUSSELL'S MEDIUM			LITMUS MILK			HISS'S SERUM—WATER MEDIA									
	Butt. (Pink)	Lead	Gas	24 Hours	48 Hours	12 Days	Dex- trose	Mal- tose	Galac- tose	Xylose	Arab- inose	Man- nite	Sacch- arose	Lac- tose	Sali- cin	Dex- trin
31. Q. M. Stable.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
35. B. Stable.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
215. W. D. Stable.....	+	+	+	D	G	G	0	0	0	0	0	0	E	E	E	E
81. Feed Trough.....	+	+	+	F	G	G	0	0	0	0	0	0	E	E	E	E
36. B. Stable.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
42. B. Stable.....	+	+	+	D	G	G	0	0	0	0	0	0	E	E	E	E
84. Feed Trough.....	+	+	+	D	G	G	0	0	0	0	0	0	E	E	E	E
86. Feed Trough.....	+	+	+	D	G	G	0	0	0	0	0	0	E	E	E	E
101. B. Stable.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
169. Stock Car.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
179. Loading Pen.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
197. Feed Trough.....	+	+	+	E	G	G	0	0	0	0	0	0	E	E	E	E
200. B. Stable.....	+	+	+	A	E	D	0	0	0	0	0	0	E	E	E	E
222. W. D. Stable.....	+	+	+	F	D	G	0	0	0	0	0	0	E	E	E	E

Paratyphoid Group.

Gärtner No. 1.....	++++++E
Gärtner 234.....	++++++E
Paracolon, A. Med. School.....	++++++E
Paracolon, Parke-Davis.....	++++++E
Paracolon, A. Med. Museum.....	++++++E
Typhl. Murium.....	++++++E
Paratyphoid B.....	++++++E
Paratyphoid A.....	++++++E
Typhoid.....	++++++E
Abort. Eq.....	++++++E

Cultures from Sporadic Cases.

92	.....
93	.....
97	.....
107	.....
132	.....
136	.....
139	.....
147	.....
150	.....
153	.....
170	.....
182	.....
185	.....
191	.....
193	.....
196	.....

Cultures from Experimental Cases.

Mule B.
Mule C.
Mule E.
Horse P.
Horse S.
Mule W.
Horse X.

AGGLUTINATION TESTS

METHOD OF PREPARING AGGLUTINATING SERUM.—Growths from agar slants were washed off with carbolized normal salt solution, the suspensions being killed in a water bath at a temperature of 60° C. for 30 minutes, after which that portion of the tube above the liquid was flamed in order to destroy any organisms which may have survived, as the tubes were not totally submerged. Cultures were then made to ascertain definitely the absence of living organisms.

The following day the suspensions received at least three washings in sterile salt solution, the centrifuge being run at a sufficient rate to pack the organisms in the base of the tubes; the supernatant fluid being poured off and replaced each time with fresh salt solution; the clumps disintegrated, and the organisms distributed evenly throughout the suspension by agitating the tube.

After the third washing, saline solution was added and the suspension filtered through cotton, the density being regulated by comparison with a nephelometer.

These solutions were inoculated intravenously, observing anti-septic precautions, the posterior auricular vein being employed as the site of inoculation.

Berkefeld filtered bouillon cultures were also used in an endeavor to procure an immune serum. (See Table 22.)

The animals displayed no apparent discomfort. In one instance the initial injection sufficed to produce a titre of 1-10,000, and the results as a whole were better than those obtained by other methods where the risk of losing the animals prevails. (See Table 22.)

The agglutination suspensions used were washed from a 24-hour agar slant with carbolized (0.5 per cent) saline solution by revolving the tube. The suspension thus made was filtered through cotton and standardized by a nephelometer. (The nephelometer is of such a density that the graduations on a 5 c.c. pipette held in the middle of a test tube of the fluid are just visible.)

The immune serum was made up in dilutions of 1-10, 1-100, and 1-1,000, with physiologic salt solution. Varying quantities were used from these dilutions to give the desired range of concentrations in the test. A series of nine tubes was set up, with an antigen control omitting the serum. The routine dilutions of serum in the test ranged from 1-200 to 1-3,300, but in running the immune serum for final titres the dilutions were from 1-1,400 to 1-10,000 and higher. Dilutions of 1-50 were used in running doubtful sera and making cross agglutinations with allied strains.

Each tube in the series contained, in addition to serum, 0.25 c.c. of saline solution and 0.2 c.c. of agglutinating fluid. Controls of the suspensions with normal serum were also employed.

The tests were incubated at 37.5° C. in a water bath for 24 hours and read at once. The positive agglutinations showed a clear fluid and a characteristic "scattering" sediment with an irregular border, which was markedly different from the negative tubes even before the tubes were agitated to reveal the clumping.

It would appear that the washing of the killed cultures does rid the suspensions of toxic material and facilitates the production of antiserum with little loss of animals.

The employment of smaller quantities of materials in the test as herein described gives more marked reactions than where larger quantities are used.

All organisms recovered which showed the slightest resemblance to *B. paratyphoid B.* or Gartner's bacillus were agglutinated as well as run through the various media.

The details of the agglutination tests are shown in Tables 17 to 24. In these tables the minus sign denotes a negative result, one plus sign partial agglutination and two plus signs complete agglutination.

From Table 18 it would appear that the maximum titre was that of Mule 13, which reached 1-400, Mule 12 being the next best, double plus at 1-200, plus-minus at 1-400. And while these apparently low titres might appear to discredit this organism (Gartner's bacillus) as the causative agent of death, such a claim could not be reasonably made in view of the peracute nature of the infection and further fact that blood serum from artificially infected animals, large and small, fails in many cases to give reactions of any significance, even after several feedings of several hundred cubic centimeters of broth cultures.

For the tests shown in Table 19, 229 cultures were obtained from various natural sources, such as feeding troughs, loading pens, etc. Of this number only 4 showed the characteristic reaction on Russell's medium, and of these 3 gave an agglutination with Gartner immune serum in dilutions of 1-3,300 or higher. The other appeared to be a paratyphoid B by its agglutinating affinity.

It would appear from Table 21 that the titres from sera of *spontaneous* cases compare favorably with those of animals inoculated *experimentally*, as some of the latter were bled as late as 8 days subsequently, whereas those of spontaneous origin lived but a few hours after the first noticeable symptoms.

TABLE 17.—AGGLUTINATION TESTS WITH CULTURES ISOLATED FROM SPORADIC CASES.

SERUM	CULTURE	1,400	2,000	2,500	2,850	3,300	4,000	5,000	6,600	10,000	TITRE	Serum Cont.	Saline Cont.
Gärtner 1	Gärtner 1, control	++	++	++	++	++	++	++	++	++	1-40,000	—	—
Gärtner 1	94 (Spleen)	++	++	++	++	++	++	++	++	++	1-20,000	—	—
Gärtner 1	141 (Axillary)	++	++	++	++	++	++	++	++	++	1-10,000	—	—
Gärtner 1	147 (Spleen)	++	++	++	++	++	++	++	++	++	1-10,000	—	—
Gärtner 1	172 (Axillary vein)	++	++	++	++	++	++	++	++	++	1-10,000	—	—
Gärtner 1	107 (Spleen)	++	++	++	++	++	++	++	++	++	1-6,600	—	—
Gärtner 1	132 (Heart blood)	++	++	++	++	++	++	++	++	++	1-6,600	—	—
Gärtner 1	92 (Spleen)	—	—	—	—	—	—	—	—	—	1-1,000	—	—
Gärtner 1	11 (Rectal culture)	—	—	—	—	—	—	—	—	—	1-660	—	—
Gärtner 1	13 (Liver)	—	—	—	—	—	—	—	—	—	1-200	—	—

TABLE 18.—AGGLUTINATION TESTS WITH SERUM FROM SPORADIC CASES.

SERUM	ANTIGEN	30	60	100	200	400	660	1,000	1,400	2,000	TITRE	Serum Cont.	Saline Cont.
Mule 1	Gärtner 1	—	—	—	—	—	—	—	—	—	1-40	—	—
Mule 2	Gärtner 1	++	++	—	—	—	—	—	—	—	1-60	—	—
Mule 3	Gärtner 1	++	++	—	—	—	—	—	—	—	1-30	—	—
Mule 4	Gärtner 1	++	++	—	—	—	—	—	—	—	1-30	—	—
Mule 5	Gärtner 1	++	++	—	—	—	—	—	—	—	1-30	—	—
Mule 6	Gärtner 1	++	++	—	—	—	—	—	—	—	1-30	—	—
Mule 7	Gärtner 1	++	++	—	—	—	—	—	—	—	1-30	—	—
Mule 8	Gärtner 1	—	—	—	—	—	—	—	—	—	1-30	—	—
Mule 9	Gärtner 1	++	++	—	—	—	—	—	—	—	1-60	—	—
Mule 10	Gärtner 1	++	++	—	—	—	—	—	—	—	1-60	—	—
Mule 11	Gärtner 1	++	++	++	++	—	—	—	—	—	1-100	—	—
Mule 12	Gärtner 1	++	++	++	++	++	—	—	—	—	1-400	—	—
Mule 13	Gärtner 1	++	++	++	++	++	—	—	—	—	1-400	—	—
Gärtner 1	Gärtner 1	++	++	++	++	++	++	++	++	++	1-40000	—	—

TABLE 19.—AGGLUTINATION TESTS WITH CULTURES FROM EXTRANEEOUS SOURCES.

CULTURE	SERUM	TITRE	Serum Cont.	Saline Cont.	SERUM	TITRE	Serum Cont.	Saline Cont.
31 QMC.	Gärtner No. 1	+ + 1-20,000	—	—	Paratyphoid B	+ 1-100	—	—
35, B. stable	Gärtner No. 1	+ + 1-10,000	—	—	Paratyphoid B	+ — 1-100	—	—
215, Feeding pen	Gärtner No. 1	+ + 1-3,300	—	—	Paratyphoid B	+ — 1-100	—	—
42	Gärtner No. 1	+ + 1-200	—	—	Paratyphoid B	+ 1-3,300	—	—
81	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
36	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
84	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
86	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
101	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
169	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
179	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
197	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
200	Gärtner No. 1	+ + 1-100	—	—	Paratyphoid B	+ — 1-100	—	—
222	Gärtner No. 1	— 1-100	—	—	Paratyphoid B	+ + 1-200	—	—
Gärtner No. 1	Gärtner No. 1	+ + 1-40000	—	—	Paratyphoid B	+ + 1-3300	—	—
					Paratyphoid B control			

TABLE 20.—AGGLUTINATION TESTS WITH CULTURES RECOVERED FROM EXPERIMENTAL ANIMALS.

SERUM	CULTURE	1,400	2,000	2,500	2,850	3,300	4,000	5,000	6,600	10,000	TITRE	Serum Cont.	Saline Cont.
Gärtner No. 1	Gärtner No. 1	+	+	+	+	+	+	+	+	+	1-40,000	—	—
Gärtner No. 1	Mule B	+	+	+	+	+	+	+	+	+	1-10,000	—	—
Gärtner No. 1	Mule C	+	+	+	+	+	+	+	+	+	1-6,600	—	—
Gärtner No. 1	Mule E*	—	—	—	—	—	—	—	—	—	1-200	—	—
Gärtner No. 1	Horse P	+	+	+	+	+	+	+	+	+	1-20,000	—	—
Gärtner No. 1	Horse S	+	+	+	+	+	+	+	+	+	1-5,000	—	—
Gärtner No. 1	Mule T	+	+	+	+	+	+	+	+	+	1-10,000	—	—
Gärtner No. 1	Mule X	+	+	+	+	+	+	+	+	+	1-2,850	—	—
Paratyphoid B	Horse U	+	+	+	+	+	+	+	+	+	1-6,600	—	—
Paracolon P. D.	Horse W	+	+	+	+	+	+	+	+	+		—	—

*Culturally identical with Gärtner's bacillus, also with *B. paratyphoid B*, but only agglutinates the latter organism at 1-400 with one culture and but 1-200 with another.

TABLE 21.—AGGLUTINATION TESTS WITH SERUM FROM EXPERIMENTAL ANIMALS.

SERUM	CULTURE	DATE FED	Date Agglutinated	TITRE
Mule H	Gärtner 104-B	Feb. 21, 1919	Mar. 10, 1919	1-200
Mule I	Gärtner 104-B	Feb. 21, 1919	Mar. 10, 1919	1-100
Mule K	Gärtner 104-B	Feb. 21, 1919	Mar. 10, 1919	1- 50
Mule L	Gärtner 141	Feb. 21, 1920	Mar. 10, 1919	1-100
Mule M	Coli communis	Feb. 21, 1919	Mar. 10, 1919	1- 50
Horse N	Gärtner 104-B	Feb. 21, 1919	Mar. 10, 1919	1- 50
Horse O	Gärtner 104-B	Feb. 21, 1919	Mar. 10, 1919	1- 50
Horse Q	Gärtner Mule No. 11	Feb. 21, 1919	Mar. 10, 1919	1- 50
Mule R	Gärtner 104-B	Feb. 21, 1919	Mar. 10, 1919	1- 50
Mule H	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Mule I	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Mule K	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Mule L	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Mule M	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Horse N	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	*1-400
Horse O	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Horse Q	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
Mule R	Gärtner 104-B	Mar. 17, 1919	Mar. 27, 1919	1-200
			Before	After
Horse S	Gärtner No. 1	May 19, 1919	1-50	1- 50
Mule T	Gärtner 104-B	May 19, 1919	1-50	1- 50
Horse U	Gärtner QMC.	May 19, 1919	1-50	1- 50
Mule V	Paracolon A. Med.	May 19, 1919	1-50	1-100
Horse W	Paracolon P. D.	May 19, 1919	1-50	†1- 50
Mule X	Paratyphoid B	May 19, 1919	1-50	1- 50
Horse Y	Coli communis	May 19, 1919	1-50	†1- 50
Mule M	Gärtner No. 1	May 19, 1919	1-50	†1- 66
Mule L	Gärtner QMC.	May 19, 1919	1-50	†1- 66

*Had also received intravenous inoculations.

†Bled May 27, 1919, 8 days subsequent to feeding; others bled just prior to death. This includes from Horse S to the bottom.

TABLE 22.—AGGLUTINATION TESTS WITH IMMUNE SERA EMPLOYED AND THEIR TITRES:

SERUM	CULTURE	METHOD OF INOCULATION	NUMBER OF INOCULATION	FINAL TITRE
62	Gärtner RV.	Subcutaneous	3	1-10,000
264	Gärtner 104-B	Subcutaneous	8	1- 7,600
398	Gärtner Sp.-2	Subcutaneous	3	1- 2,000
263	Gärtner 104-B	Subcutaneous	8	1- 6,600
63	Gärtner RV.	Subcutaneous	8	1- 6,600
486	Typhi murium	Subcutaneous	6	1- 2,000
421-A	Paracolon A. Mus.	Subcutaneous	4	1- 2,000
657	Gärtner 104-B	Intraperitoneal	3	1- 6,600
388	Gärtner No. 1	Intraperitoneal	1	1- 5,000
60	Gärtner No. 1	Intraperitoneal	2	1-10,000
756-A	Gärtner 104-B	Intraperitoneal	4	1- 6,600
416	Paracolon A. Mus.	Intraperitoneal	3	1- 3,300
61-A	Gärtner No. 1	Intravenous	2	1-10,000
760	Gärtner No. 1	Intravenous	1	1- 6,600
9	Gärtner 234	Intravenous	1	1-10,000
10	Paratyphoid A	Intravenous	1	1-10,000
421-B	Paracolon A. Med.	Intravenous	2	1- 6,600
61-B	Gärtner, Horse P	Intravenous	2	1-10,000
5	Gärtner No. 1	Intravenous	3	1-40,000
6	Gärtner No. 1	Intravenous	3	1-25,000
7	Gärtner 104-B, Sp.-2 and QMC.	Intravenous	3	1- 5,000
*1	Gärtner No. 1	Subcutaneous	3	1- 1,000
*4	Gärtner 104-B	Subcutaneous	3	1- 1,400
*3	Gärtner 104-B, RV. and QMC.	Subcutaneous	3	1- 3,300

*Sterile filtrate of bouillon cultures.

Other immune sera were employed, but did not have their origin in the Southwestern Laboratory.

With regard to Table 24, it is interesting to note that while *B. paratyphoid B* is practically identical culturally, it is not so closely allied serologically as typhosus. It would appear that serological and cultural relationships are not necessarily consistent.

COMPLEMENT-FIXATION TESTS

The complement-fixation test demonstrated the fact that typhoid serum would fix the complement in the presence of the several strains of Gärtner's bacillus as readily as their homologous sera (immune sera from rabbits), but added little to the agglutination reactions.

In one sporadic case, that of Mule 12, the complement was fixed in the presence of 0.1 and 0.2 of the serum, while the agglutination test showed it to be plus-minus at 1-400.

The technic of the test differed in no way from that employed for glanders except in the case of the antigen which comprised a suspension of organisms washed from solid medium with carbolized salt solution, instead of an autolysate. One-tenth of 1 c.c. of serum was employed. Twice the antigenic unit was employed, provided twice that quantity did not inhibit alone or in company with negative serum. (See Table 25.)

TABLE 25.—CROSS-FIXATION OF MEMBERS OF TYPHOID-DYSENTERY GROUP.

SERUM	ANTIGEN	REACTION	CONTROLS	
			SERUM	ANTIGEN
Gärtner 388	Gärtner No. 1	++++	—	—
Gärtner 52	Gärtner No. 1	++++	—	—
Gärtner 657	Gärtner No. 1	++++	—	—
B. typhosus	Gärtner No. 1	++++	—	—
Gärtner 388	Gärtner OMC.	++++	—	—
Gärtner 52	Gärtner OMC.	++++	—	—
Gärtner 657	Gärtner OMC.	++++	—	—
B. typhosus	Gärtner OMC.	++++	—	—
Gärtner 388	Gärtner G. P.-65	++++	—	—
Gärtner 388	Gärtner 104-B	++++	—	—
Gärtner 104-B	Gärtner 104-B	++++	—	—
Gärtner Sp.-2	Gärtner 104-B	++++	—	—
B. paratyphoid A	Gärtner 104-B	—	—	—
B. paratyphoid B	Gärtner 104-B	—	—	—
B. dysenteriae (Flex.)	Gärtner 104-B	—	—	—
B. dysenteriae (Hiss.)	Gärtner 104-B	—	—	—
B. dysenteriae (Shig.)	Gärtner 104-B	—	—	—
B. typhosus	Gärtner 104-B	++++	—	—

CONCLUSIONS

In terminating the preliminary bacteriological study of this fatal equine disease the following conclusions seem justified:

1. In the absence of more conclusive evidence it can not be

claimed that *Bacillus enteritidis* Gartner is the prime and specific cause of the disease in question. Yet it appears that this organism, and possibly certain strains of *B. paratyphoid* B, are closely related to the bacteriology of this disease. The symptoms-complex of the animals experimentally fed *B. enteritidis* Gartner isolated from the spontaneous cases are identical with those displayed by animals suffering from a spontaneous attack. *B. enteritidis* Gartner was isolated from approximately 22 per cent of the spontaneous cases under observation.

2. Experimental animals not fasted to induce fatigue were not susceptible to *B. enteritidis* Gartner infection by feeding.

3. *B. enteritidis* Gartner proved fatal to experimental mules which were fasted and subjected to conditions inducing fatigue, as incurred incident to shipment.

4. *B. enteritidis* Gartner could not always be demonstrated in the heart blood, even following death in experimental animals by artificial infection, suggesting that the type of the disease induced is probably a toxemia per se.

5. Complement-fixing bodies or agglutinins could not be demonstrated in the blood of all sporadic cases, and negative results to the above serological tests were likewise obtained in experimental mules artificially infected.

6. Feeding avirulent cultures, as well as inoculating killed cultures subcutaneously and intravenously and live cultures subcutaneously, appeared to have produced a degree of immunity. Yet the value of immune serum, as well as bacterins, in establishing an artificial immunity was not satisfactorily or completely demonstrated. Some limited experimental evidence is indicative of their value.

7. *B. enteritidis* Gartner appears to lead a somewhat saprophytic existence and to possess a capricious pathogenesis. It is possible that some animals possess a degree of immunity or resistance against this organism.

8. Paratyphoid organisms were encountered in cultures from extraneous sources, though their pathogenic significance was not completely determined. The isolation of *B. enteritidis* Gartner from equine feces of a healthy animal is suggestive of the relation which this organism might play in the development of an acute toxic gastro-enteritis, exclusive of outside sources of infection.

9. The sterile filtrate of *B. enteritidis* Gartner, experimentally fed, was not sufficient to induce illness in healthy mules, and it

appears that the live organisms in the digestive tube are essential for the elaboration of additional poison.

10. The relation of *B. coli*-like organisms constantly encountered in the internal organs of animals suffering from acute toxic gastro-enteritis could not be determined experimentally. It is believed, however, that a colon bacillosis is a common secondary invader.

11. *B. enteritidis* Gartner, *B. paratyphoid B* and *B. paracolon* appear closely related morphologically and culturally, and certain strains of the former and latter were identical serologically.

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REFERENCES

1. Dick. Jour. of Infec. Dis., vol. 23, no. 6.
2. Bul. 207-208, Ky. Agric. Exper. Station.
3. Hiss and Zinsser. A Textbook of Bacteriology. 1917.
4. A Study of Paratyphoid Bacilli Isolated from Cases of Hog Cholera. Jr. Exp. Med., Dec. 1, 1918.
5. Nineteenth Annual Report, Bureau of Animal Industry, Dept. Agric., 1902, p. 297-331.
6. Meyer, Traum and Roadhouse. Reprint from Jour. of Am. Vet. Med. Assn., April, 1916.
7. Park and Williams. Pathogenic Microorganisms. 1914.
8. Osler's Modern Medicine, 1907.
9. Edelmann (Mohler and Eichhorn). Meat Hygiene.
10. Stitt. Practical Bacteriology, Blood Work, Parasitology, 3d edition.
11. Buchanan. Veterinary Bacteriology.

INTUSSUSCEPTION OF THE INTESTINES¹

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THE subject of intestinal obstruction has always been one of great interest and will continue to be so until our methods of diagnosis and results in treatment are greatly advanced.

Abdominal surgery in veterinary practice is usually confined to puncture of the intestine, spaying and occasionally rumenotomy, but there is a fertile field for work along other lines and with other operations.

The intestinal tract of our large domestic animals is a long muscular tube, varying in size, with anatomic constrictions in certain portions formed from changes in the course of the canal or from the gradual decrease in the size of the canal. This tube has for its function secretion and absorption and the power of propelling its contents by its own muscular contractions.

Intussusception or invagination results when one part of the intestine passes in telescopic fashion into the part immediately below. Having once been fairly engulfed, the normal peristaltic movements tend to increase the displacement until the utmost degree of invagination is attained. In the small bowel the limit is attained much sooner than in the large.

An intussusception usually consists of three parts or layers of bowel, the entering and returning, the intussusceptum, and the ensheathing layer, the intussusciens. This whole mass may in turn be invaginated which would involve five layers of intestine.

The effect of intussusception is to drag severely on the mesentery which is drawn into the bowel. A minor result of this is that the tumor has a curved shape like a sausage. The more important effects are upon the circulation and the lumen of the bowel. The former soon becomes impeded and ultimately arrested, while the latter tends equally to pass from stenosis to occlusion. The drag on the mesentery creates stenosis of the veins, the mucous membrane of the bowel becomes congested and blood and mucus are exuded from its surface into the bowel, to be later discharged from its surface per rectum. Ultimately the circulation is entirely arrested, the bowel is occluded and the tissues become gangrenous.

CAUSES

Nothnagel demonstrates by experiment that circular spasms of the intestine may be the starting point of invagination, and assumes

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

that such invagination may frequently occur under natural circumstances, and after slight symptoms of colic disappear again.

The immediate cause seems to be peristaltic irregularity whereby one part of the intestine is active, while a neighboring part is inactive. This may be brought about by anything which irritates the intestine or produces spasms of certain portions of the intestinal tract.

Law gives as a cause the drinking of ice-cold water or the eating of frosted grass or fodder. It sometimes follows diarrhea or constipation with severe straining. Occasionally it is associated with parasites either in the intestinal lumen or in the wall, and at other times it depends on pressure or traction of tumors or new growths. Straining, from being controlled when cast for operation, is also a cause of invagination.

SYMPTOMS

The symptoms usually begin with violent colic, the animal pawing, kicking at its belly, throwing itself violently and rolling.

Rumination, peristalsis and milk secretion cease. Cattle sometimes become vicious and will bawl, kick and bunt at the attendant. The passage of feces stops. A few small pellets covered with mucus and blood may be passed. The rectum and posterior colon contain mucus streaked with blood and occasionally blood clots. The animal does not bloat. The temperature remains normal, but the pulse is increased, sometimes as high as 120 or 150, and becomes weak.

After a few hours the violent colicky symptoms cease. Then the animal appears nervous, standing most of the time, occasionally switching the tail, lifting the hind legs, and making frequent attempts at urination. Cattle often stretch and many times stand with hind feet in the gutter. At this stage rectal injections of warm water will usually cause a slight increase in the pain.

Rectal examination will find an absence of feces but the presence of small masses of mucus and blood. The intussusception may be felt as a firm mass somewhat as the uterus feels in early pregnancy. If not too far anterior one may recognize the edge of the intestine where it is involuted within itself. Movement of the mass tends to drag on the mesentery, which is already tightened, hence it causes pain.

In cattle it is usually the ileum which is involved, but it may be any portion of the small intestine. It is not liable to be the large intestine because of its peculiar attachments.

In the equine species it is the colt that is most often affected, and as with other young animals and children it is most often the ileum which has passed into the cecum. We have one specimen where the cecum was telescoped into the ileum. Cases are reported in older horses where the cecum has passed completely into the colon.

In case the animal is far advanced in pregnancy, finding the intussusception per rectum becomes difficult and the diagnosis will have to be made on the other symptoms shown.

Among the other diseases which produce somewhat similar symptoms in cattle we might mention traumatic gastritis, acute indigestion, impaction, torsion of the uterus in the pregnant animal, and uretral or urethral colic, that is, colic due to calculi in the ureter or urethra.

Intussusception may be differentiated from these diseases by the following symptoms: In traumatic gastritis we get greater increase in temperature, passage of feces or their presence in the rectum and colon. The pain is not so acute as to produce violent colicky symptoms. Acute indigestion produces bloating, also there is the passage of feces or their presence in the rectum or colon. In impaction there is lack of violent pain, more temperature, firmness of the contents of the rumen, or, in case of impaction of the third stomach, pain upon pressure over that part. In torsion of the uterus there is the presence of feces and vaginal examination will reveal the twisting of that organ with the mucous membrane lying in folds. By making a rectal examination in uretral colic, the calculus may be felt or its presence shown when pressure is applied to the ureter at the point where it is lodged. With urethral colic there is distention of the urinary bladder and also of the urethra above the point where the calculus is lodged.

In the horse we may also have impaction of the colon and volvulus producing symptoms like intussusception. With the former the pain is usually less severe and rectal examination will show the firm mass in the colon, while with the latter the pain does not tend to subside and the temperature is higher.

TREATMENT

If the diagnosis is made early, the intussusception may sometimes be reduced by manipulations per rectum. One must use great care in this, however, as it is difficult to tell just how necrotic the intestine is, and rupture may occur if the manipulations are too severe. The injection of large quantities of warm water into the posterior

bowel will sometimes straighten out the intestine if adhesions have not already occurred.

Recovery may take place by the formation of adhesions at the point where the inner layer of the intussuscepted bowel enters the outer portion. The whole mass included may then slough away and be passed per rectum. Several cases where this has occurred have been reported in veterinary literature. Jones, in the *Veterinary News*, reports 15 feet of small intestine sloughing and being expelled per rectum after severe colic in the bullock.

OPERATION

The animal may be operated upon either standing or cast and under local or general anesthesia. If operated upon standing the animal should be confined in stocks or may be secured against a gate or stanchion with the right side exposed. Very resistant animals may require confinement in lateral recumbency on the left side with the fore feet stretched forward and the hind feet stretched backward.

The animal may be anesthetized by an injection of chloral per rectum, with a local anesthetic injected at the point of incision of the skin and abdominal muscles. This will produce sufficient anesthesia, and if the animal is to be operated upon standing the amount of chloral should be small. No anesthesia of the intestine is necessary, as manipulation or cutting of the intestine does not seem to cause the animal pain provided traction is not too severe on the mesentery.

The operative area should be shaved and thoroughly disinfected, preferably with an alcholic solution or with gasoline and iodine, and then covered with an antiseptic or aseptic cloth through which an incision is made to correspond to the skin incision which is to follow.

When ready for operation an incision 8 to 10 inches long is made through the skin in the right flank, beginning at a point equidistant from the lateral processes of the lumbar vertebrae, the external tuberosity of the ileum, and the last rib, and carried downward perpendicular to the spinal column. The fibers of the external oblique muscle are then separated obliquely downward and forward and the internal oblique in a corresponding manner obliquely downward and backward, so that the openings through the two muscles form an X. The peritoneum is then punctured and the wound dilated sufficiently to allow the introduction of the hand. In spreading the muscles in this manner it is not necessary to suture

the peritoneum and muscular coats after the operation on the intestine is completed, as the cross fibers tend to close the wound.

An incision may be made directly through the oblique muscles, but this produces more hemorrhage and requires more difficult suturing, besides producing a wound which is liable to gape and allow infection to enter during the operation.

After the incision has been made through the abdominal wall the hand is inserted and a search made for the involuted intestine. An assistant may aid in this search by grasping the diseased intestine per rectum and carrying it up to the incision.

An attempt may now be made to straighten the involuted intestine. Even though successful in this, it may be necessary to perform resection and anastomosis of the intestine, as the walls are very liable to be so diseased or necrotic as to rupture or produce stenosis or adhesion later on. If it is thought necessary to perform resection, draw the involved portion of the intestine out through the wound until a healthy portion with good blood supply appears.

The mesenteric vessels which supply the diseased intestine may now be compressed with forceps and ligated well down from the intestine. The normal intestine is clamped with the compression forceps, the jaws of which are covered with rubber tubing to prevent injury, one pair being placed each side of the diseased tissue. The intestine is then severed with scissors about 1 cm. from the forceps toward the diseased part. The cut ends are then washed with salt solution, care being taken not to let the intestinal contents enter the abdominal cavity or contaminate the healthy intestine. The incisions are then carried into the mesentery in a V shape for 10 or 12 cm., after which the two pair of forceps are brought together.

Two sutures with long ends are now passed through the walls at opposite sides of the intestines and the forceps removed. These long threads are to be used as stays to keep the edges of the intestine tense while being sutured. Two rows of sutures are used, the second burying the first. A continuous suture may be used by bringing the two edges of serosa in apposition and applying the suture from the lumen of the intestine. This suture, however, is more liable to prevent dilation and to produce stenosis. Another method is to use a continuous suture for the first half of the intestine and then use Lembert intestinal suture for the remaining half. A better method, however, is to use an interrupted suture known as Halstead's suture. This is a double intestinal suture or a mattress

suture turning the serous coats in. The suture has the advantage over the Lembert suture in that there are only half as many knots to tie and to produce irritation to the surrounding tissue.

After the two ends of the intestine have been united, the cut edges of the mesentery are brought together by means of either a continuous or interrupted suture. When the anastomosis is completed, a large supply of warm normal salt solution is allowed to flow over the intestine until healthy contractions have been stimulated and a normal blood supply established. If the operation has taken some time the intestine at this point may be edematous, and if a free circulation of blood and normal contractions are established this edema soon disappears and the chances of infection and adhesion at this point are greatly reduced.

After replacing the intestine in the abdominal cavity the margins of the abdominal wound are thoroughly cleansed and sutured. If the muscle fibers have simply been separated the skin is all that needs to be sutured, otherwise the peritoneum and muscle must be sutured first. In suturing the skin wound the mattress suture is preferred, as it prevents the edges of the wound from turning in and brings a large surface of the skin together so that it is more liable to prevent infection from gaining entrance between the sutures.

After releasing the animal a rectal injection of warm salt solution may be used and stimulants given per mouth or subcutem.

NOTE—Discussion of this paper is reported in the proceedings on page 627 of this issue of the JOURNAL.

“Foot-and-mouth disease is now ravaging all parts of Switzerland. The government has prohibited all cattle markets and has even forbidden farmers from the infected districts entering the cities or villages. A military slaughtering department has been mobilized to kill slightly infected cattle, whose meat, after careful veterinary inspection, is preserved. The epidemic is said to have reached Switzerland from Germany, Austria, and Italy. The flocks of Swiss goats which the American Government recently bought for export to the Philippines are being quarantined for six months.”—*Holstein-Friesian Register* (December 15).

E. S. Brigham, Vermont's commissioner of agriculture, and himself a successful farmer, told me in Montpelier that Vermont's ambition—as well as his own—is to get the largest number of accredited herds in the Union.—*Country Gentleman* (December 27).

SOME CARRIERS OF ANTHRAX INFECTION¹

By HARRY MORRIS, *Baton Rouge, La.*

NOTWITHSTANDING the fact that anthrax is one of the oldest diseases known to science and the first proved to be caused by a specific micro-organism, many interesting facts may still be found in a study of this ancient disease. Not only is the disease of importance to the live-stock sanitarian, but also to the public health official, because anthrax affects man as well as the domestic animal. While sporadic cases of anthrax are reported from many localities in North America, enzootics of the disease occur in the Lower Mississippi Valley and along the Gulf of Mexico.

In discussing the subject of "Some Carriers of Anthrax Infection" a brief report will be given of some of the work done in the Pathological Laboratory of the Louisiana Experiment Station during recent years. The cause and symptoms of the disease will not be discussed, because all veterinarians are more or less familiar with the disease. One of the most important factors to be considered in the study of the carriers of any disease is the source of infection. The source of anthrax infection can always be traced directly or indirectly to an animal sick with anthrax, or to the carcass of an animal that has died of this disease, no matter whether the infection be in the soil of the pasture field or in the bristles of the shaving brush.

In Louisiana Bulletin No. 136 a report was given of experiments carried on with flesh-eating animals and carrion-eating birds as carriers of anthrax. These carriers included the dog, hog, cat, opossum, chicken, and buzzard. All were found capable of spreading anthrax infection after having fed upon anthrax-infected flesh or artificially prepared food containing anthrax spores. Anthrax infection was found in the feces of all except the buzzard. In the case of the buzzard, anthrax infection was recovered from its feet and beak for a period of 48 hours after having fed upon an anthrax carcass.

It is not known how long contaminated fecal matter will continue to be a source of infection. During the progress of this work feces were collected from the colon of a dog which had been fed anthrax spores. After a lapse of 8 years virulent anthrax can be obtained from this material.

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

Later it was found by experiment that the blood-sucking insects, skin piercing, after they had fed upon the blood of an anthrax-infected animal, were capable of transmitting the disease to healthy ones. In this work the horn-fly, the green-headed horse-fly and the swamp mosquito were used. The transmission seemed to be mechanical and the infection was carried upon the soiled proboscides of the insects.

During the past year experiments were carried on using the non-biting flies as carriers of anthrax. It was found that the common house-fly and the "blue bottle" fly could carry infection from anthrax flesh to a healthy animal by simply walking over a fresh surface wound on the latter. The "blue bottle" or blow-fly, bred out of an unopened anthrax carcass, did not carry anthrax infection in or on its body. This seemed to be due to the destruction of the anthrax bacilli in the carcass by the process of putrefaction. The same fly bred in the presence of anthrax spores did carry anthrax on and in its body. This proves the importance of keeping the natural openings of the carcass closed and the skin free from lesions, as anthrax spores do not form in the unopened carcass; but if the carcass is opened and spores allowed to form, the process of decomposition has no effect upon them.

The little Argentine ant leaves a trail of infection after having fed upon an anthrax carcass; this point has been proved many times in the Laboratory.

One more possible carrier of anthrax should be discussed at this meeting, in conjunction with similar carriers of other diseases, and some action for its control should be taken by this body of sanitarians. This carrier is the anthrax vaccine of today, sold upon the open market, to anyone wishing to purchase it, and administered by unscientific men. In past years this unlimited sale of anthrax vaccine has been practiced in the South, with little danger to either man or domestic animal. The vaccine contained nothing but the vegetative form of anthrax, which had passed through the process of attenuation. After remaining on the shelf of the country drug store for an indefinite period of time this product was absolutely harmless, even to the white mouse or the sterile agar slant. But the same thing does not hold true with the more efficient spore vaccine of today; every cubic centimeter contains millions of anthrax spores, and much better results are being reported from its use and the accompanying anti-anthrax serum than were obtained from the sterile beef-broth vaccine of a few years ago. But outbreaks of the

disease are sure to follow its use if sold on the open market and administered by the unscientific man. This point should be of as great importance to the manufacturers of the product as it is to the live-stock owner.

In the control of anthrax many problems may be studied, such as the elimination and eradication of insects by means of drainage, screens and other sanitary measures; but they all lead to the one great sanitary problem, and, quoting from Dr. Dalrymple, who has been teaching and preaching anthrax control in the South for many years, "the neglect to dispose of the anthrax carcass is, without doubt, the factor most responsible for the continuance and spread of anthrax in the South."

BILL TO PERMIT SENDING MEDICINES BY MAIL

To the Editor:

Many veterinarians who are engaged in country practice probably know the Post Office Department has ruled that poison, even medicinal substances, could not be sent by mail.

A bill to amend the law permitting the sending of medicines by mail has been introduced in the House of Representatives, and on behalf of the A. V. M. A. I wrote Congressman Steenerson of Minnesota, Chairman of the Committee on Post Offices and Post Roads, urging the passage of this bill. In answer to my letter, Congressman Steenerson writes: "The Postmaster General has favorably reported this bill, and I think there will be little or no opposition to its being enacted into law."

N. S. MAYO.

4/12/20
Note Staff

DEFICIENCY DISEASES¹

By C. A. CARY, *Auburn, Ala.*

IN order to indicate or point out the meaning of the term "deficiency diseases" I may be excused for giving a brief definition, yet knowing that short definitions are always partially incomplete and indefinite and consequently very often unsatisfactory.

One author says "an insufficiency disease in one due to defective metabolism caused by a lack of vitamins in the diet." Another author says it is "any disease due to lack of some element in the diet." A vitamin is "one of a group of substances of unknown composition, present in very small amount in natural food-stuffs, which are essential to normal metabolism, and the lack of which in the dietary causes beriberi and other deficiency diseases." Another says the lack of the proper vitamin in the diet causes scurvy and rachitis.

Funk in the London *Lancet* in 1911 gave the name vitamins to all substances that were curative or preventive of deficiency diseases. He classified them as anti-scorbutic vitamins, anti-neuritic vitamins, etc. Since that time other investigators have proposed new names for this class of materials, such as "growth substances," "accessory food substances," "growth determinants" and "food hormones."

McCollum of Johns-Hopkins claims that the word "vitamin" is incorrectly applied to this group of substances, because "amine" in organic chemistry means a compound derived from ammonia by the substitution of one or more of its hydrogen atoms by various organic radicals. He and his co-workers have found that there are organic substances that contain no nitrogen and yet they are essential to health, to growth of an animal body and to reproduction. His experiments with these were confined chiefly to tests with rats and guinea pigs. The two unknown organic substances that McCollum has investigated and tested are named by him (1) "fat-soluble A" and (2) "water-soluble B."

Fat-soluble A is so called because it is soluble in fat, especially butter-fat. It is an "unidentified dietary essential." Its best sources are butter-fat, whole milk, egg-yolk fats and the leaves of plants. It is found in small amounts in seeds of plants but not in sufficient quantities to maintain growth, reproduction and health and prevent

¹ Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

a specific eye disease that McCollum calls xerophthalmia. The disease is readily cured by feeding the affected rats small quantities of butter-fat in the ration. Animal body fats and vegetable fats do not contain fat-soluble A. All test animals (rats) fed chemically balanced rations which did not contain fat-soluble A did not take on normal growth, became stunted and emaciated, lost hair, had deficient reproduction and developed xerophthalmia. This same eye disease has been observed in other experimental animals and recovery has been readily obtained by introducing 1 to 5 per cent of butter-fat to the ration. This eye disease appears to be a conjunctivitis, keratitis, and may become a pan-opthalmia. It is said to have occurred in a large number of children in Japan in a time of food shortage. It also occurred in children of Denmark when fed on separator milk. These children recovered when given breast milk and butter-fat.

Beriberi is a polyneuritic disease found among people who live largely on polished rice or on fish. Its principal lesions are those of a multiple peripheral neuritis. A man fed on polished rice for 3 months will develop this disease. Fowls fed on polished rice have polyneuritis gallinarum. Suckling children of affected mothers may have infantile beriberi. There are four or five clinical types of this disease. The atrophic form is manifest by slowly developing muscular weakness leading to paralysis of the lower limbs and trunk, rarely extending to the arms, head and neck. Atrophy of the affected muscles quickly ensues, with loss of deep reflexes.

It is extremely interesting to note here how closely these clinical symptoms follow the clinical symptoms of the posterior limbs and body paralysis of hogs. Is it not highly probable that posterior limb paresis of swine is at times a nutritional disease? It occurs in swine fed on corn alone—deficient in required organic and inorganic materials and in fat-soluble A or the unknown extract or the water-soluble B or some other unknown food essential. It also occurs in hogs fed on peanuts alone, a diet still more deficient in the essential food materials. Beriberi is said to be readily cured by giving an extract of rice hulls and rice bran. This extract may be water-soluble B (McCollum).

Dogs of the South have the sore mouth or black tongue. The causes are said to be (1) infection, (2) faulty nutrition, (3) hook-worm. Dr. J. I. Handley made repeated transfusions of blood from infected to well dogs and never thus transmitted the disease. Inoculations by injections, scarifications, etc., have been made, and the

disease has never thus been transmitted. Close contact of the sick with the well dogs has failed to transmit it. It appears that all attempts at artificial transmission have failed. The clinical symptoms (by Dr. Salter of Dawson, Ga.) are at first inability to swallow, then salivation, ulceration of gums, tongue and other regions of the mouth, with a distinct characteristic odor from the mouth; at first constipation, followed by periodic diarrhea; later blood may be passed with feces. In the early stages the affected dog is lame in one or both hind limbs. This lameness disappears when the characteristic mouth symptoms appear. Eyes sometimes exhibit conjunctivitis. Sequels in bird dogs are loss of acute smelling or hearing and liability to show special nerve shock or going to pieces in the hunting. Some never fully recover. It occurs in bird dogs, collies, hounds, bulldogs, etc., but rather infrequently in scrub dogs.

Postmortem lesions: Ulcers of mouth and sometimes there are ulcers in the stomach and intestines. As far as I can determine there are no distinct records of chronic cases. Most cases die in 6 to 14 days or recover. There are, no doubt, chronic cases, and such cases are not observed until they become acute. Why class this disease as a deficiency disease?

Chittenden and Underhill reported in the *American Journal of Physiology* in 1917 (vol. 44, No. 13) that they fed a restricted diet of crackers, cooked peas and cottonseed oil to dogs, and in 2 to 8 months the dogs developed typical sore mouth, severe diarrhea and skin changes that were very suggestive of pellagra in man. This diet was very deficient in McCollum's fat-soluble A. It is not conclusive that sore mouth in dogs is altogether a deficiency disease, but it is very strongly suggestive. In some cases of sore mouth the ration or diet was very narrow, often confined to corn-meal or corn-bread made without oil or meat or milk. Often the only meat the dog obtained was from carcasses.

Note the striking similarity of sore mouth in dogs and acute cases of pellagra in man—ulceration of the mouth, and diarrhea and defective digestion, nervous symptoms. In man pellagra is generally chronic. In the dog sore mouth as observed is apparently nearly always acute. It may be said that complications often kill the dog—such as absorption of toxins from the mouth and alimentary canal. The same may be said of pellagra. Pellagra has been produced in 5 out of 11 men who were fed a deficiency diet. Yet some claim it is primarily due to a defective diet that

prepares the tissues or body for an infective germ—a complex-caused disease. It is certain that many chronic cases of pellegra recover when given a corrected diet containing not only a chemically balanced diet but a nutritionally balanced or biologically balanced diet. I have seen a number of dogs with the sore mouth get well by giving a restricted non-irritating diet until the ulcers heal and then give whole milk and other foods that were nutritionally balanced. But the dog with an acute case does not stand the same relative chance for recovery as the chronic case of pellegra.

Osteomalacia, along with rachitis and osteoporosis, has been classed as a deficiency disease. These three diseases have many points in common, and some are inclined to regard them as one disease with three types or forms. Rachitis is a disease of the young where there is a constitutional malnutrition exhibiting incomplete development of the bones and cartilages, resulting in bone deformities. Diminished deposition of lime salts occurs in the long bones of the limbs, in the ribs and in the skull. There is also an absorption of lime salts in bones already formed. Thus hard bones become soft and flexible. In osteoporosis there is a concentric atrophy (a halisteresis of compact and cancellated bone) and an excessive development of blood vessels (hyperemia), fibrous and cellular elements of the bones involved. In osteomalacia there is a distinct hyperemia of the bone and marrow; the medullary spaces are enlarged. The bone changes can not be differentiated from osteoporosis if each case is studied microscopically and macroscopically in the same stage of retrogression or progression. Absorption and removal of bone salts, hyperemia, an excess of cells (fat and osteoblasts, etc.) are relatively the same in osteomalacia and osteoporosis.

In South Alabama along the coastal plain region sometimes called the wire-grass region there are years when a large number of cases of osteomalacia appear in cattle, chiefly cows. By the laymen the disease is termed "sweeny" of cattle or "creeping sickness." When the grass is short the cow with a suckling calf takes on flesh and gives her normal flow of milk. By August 1 or September 1 the summer rains cease and the mature wire grass gets very tough and indigestible. Then the cow begins to get poor, shows emaciation, and atrophy of muscles and fat. She exhibits a depraved appetite, tries to chew old bones, and some are said to eat slugs and grasshoppers. Some cows get very weak and lie down most of the time. If the fall rains come and the grass is revived or the cow is fed or

turned into the velvet-bean field or pea field or soy beans, or on a good pasture, she rapidly recovers. Very often when the muscles of the limbs and back are atrophied, the bones become soft and flexible, the ribs may bend or become indented, the transverse processes of the lumbar vertebræ may be flexed (up and down) by slight pressure of the hand. In some cases of long standing the pelvis becomes deformed and pressure on the nerves produces paralysis. In rare cases the bones of the limbs or pelvis or the ribs may be fractured. In a few instances heifers, steers or bulls may develop osteomalacia. This is especially true if there be some primary reducing factor or if the drouth is long and they get poor from lack of sufficient feed. The milch cow goes down with it more frequently and earlier than the heifer, steer or bull, because she gives most of her feed to produce milk, and the heavier the milker the sooner the cow develops this most rapidly retrogressive change in the bones. The calf suckling the cow does not develop it, and always remains fat and growthy as long as its dam gives milk.

Why is this a deficiency disease? The land is sandy and has no lime, hence there is little or no lime in the soil or water, but there may be some in the plants, the wild grasses; but when the old grass is tough and indigestible and there is no young grass on account of the drouth, then the cow suffers for fat-soluble A, lime and phosphates. The body supply soon becomes exhausted in the milking cow and she gets no feed from the tough, indigestible and old grass. It may not be alone a deficiency in chemical lime and phosphates but also in some physiological or biological substances the lack of which starts or establishes pathological changes.

Scorbutus is the most distinct deficiency disease in man. It occurs in sailors and miners and children and is due to a deficiency in some essential nutritional substance found in potatoes, oranges, lemons, apples, and other fruits. It is supposed to be associated with the vegetable acids, such as malic acid. A prolonged diet of dry salt meat and white wheat flour or corn-meal develops it. It is very possible that scorbutus in the human is a form or type of pellagra. In man scorbutus is coexistent with rachitis. Rachitis is held as a distinct disease, yet often associated in children with scorbutus. Pigs, hogs, pups and dogs may have it, and possibly calves, cows and horses. I have seen cases in horses where the teeth were loose and could be picked out with the fingers and many of the other characteristics of scorbutus were present. It is not improbable that scorbutus is associated with many cases of rachitis

in pigs and pups and with osteomalacia and osteoporosis in mature cattle and horses. It is time for veterinarians to observe and when possible make careful and accurate records of causes, clinical symptoms and lesions. Also they should teach prevention and try balanced biological rations as the chief remedy.

In Florida and some parts of Georgia and Alabama where velvet beans are grown in large numbers, hogs are fed largely on them. If brood sows are fed exclusively on velvet beans during pregnancy the sows abort, or when pigs are carried to farrowing time they may be deformed or they do not make normal growth but become stunted. Now this may or may not be a congenital deficiency disease, but it certainly looks suspicious and calls for investigation. It may not be amiss to refer to abortion as a disease that may be caused by some feeds, and if defective or deficient feeds are not primary exciting causes they certainly can be predisposing causes.

I predict the time will come when the veterinarians and the dairy-men will find that many cases of so-called contagious abortion are found to be cases due to overfeeding cottonseed meal or some other unbalanced chemical, physiological or pathological feed. This is a day or an age of germ diseases. A few decades—some three or four—have seen the progressive rise of bacteriology in medicine and in the arts and sciences, and now the laity and the medical men think, reason and practice medicine with germs, infections, disinfectants, bacterins, sera, etc., ad infinitum, and some forget that there are other things that may cause disease. McCollum, Funk, Mendel and others are harking back to foods and feeds to find why some men, children and animals are physically defective in growth, reproduction, longevity and health. This is an age of mixed infections, mixed diseases, symptoms complex and causes complex.

CAESARIAN SECTION IN THE SOW¹

By J. N. GOULD, *Worthington, Minn.*

THIS important operation is not a difficult one after the practitioner becomes familiar with the technique. After becoming somewhat expert in handling these cases, the veterinarian will much rather operate than make the delivery with the forceps.

There is nothing about this operation that should deter the practitioner of average ability from employing it as often as the cases are presented.

I am of the opinion that fear of failure often prompts the young practitioner to use the forceps, rather than perform Caesarian section, as the lack of skill is not so apparent to the owner and bystanders.

For many years I employed this operation only as a last resort, and consequently my failures were many and successes few. Later on I began using this method more frequently and as I became more skillful the proportion of successful operations increased, especially when I operated mostly on fresh cases.

As a preliminary to becoming a successful operator on these cases the practitioner should secure hog intestines from the local slaughter house, on which he can learn to manipulate the sutures and needle. Dogs are particularly fine subjects for practice. They enable the novice to become familiar with handling small patients under anesthesia and furnish opportunity of overcoming awkwardness in handling sutures and the internal organs of animals. In my own case the factor that most improved my technique was the handling of dogs and performing the simpler operations on the stomach and bowels.

The instruments and materials needed for the operation are few and the ordinary veterinarian's office will supply them without any additions. They are cambric needle, scalpel, large curved needle, pair small pig forceps, sterile catgut suture, heavy suture tape, a piece of gauze about 3 feet square, tincture of iodine, antiseptic soap, sterile normal saline solution, chloroform and ether. An operating table need not be elaborate, but can be any bench of sufficient height for convenience of operator. The instruments and gauze should be thoroughly sterilized and the hands of the operator scrubbed with some antiseptic soap. I have not been in the habit of

¹ Paper presented at the Fifty-sixth Annual Meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

using rubber operating gloves, but they would, I think, add much to the success of the operation.

I use a cone or large can for a container to hold the cotton saturated with the anesthetic and start the patient with chloroform. When partly under the drug use ether for the balance of the time. I usually start giving the anesthetic with the patient on the floor and then place the patient on the operating table when it is partly under the anesthetic. This avoids a lot of struggling and delay.

The instruments and patient can be made ready while the anesthetic is being given. The right side is selected for the incision and is either thoroughly brushed dry and then painted with tincture of iodine or the hair over the site is clipped and the skin thoroughly cleansed with antiseptic soap and then covered with the sterile gauze.

The opening is made midway between the ileum and the last rib; getting it as high as possible and large enough so the operator's hand can be inserted easily. The size of the incision is important. If it is not of sufficient size the uterine horns may be ruptured when this organ is drawn outside.

After the incision is made the entire uterine mass and fetal bodies are brought outside and placed on the gauze covering.

The horn having the larger number of pigs is selected first and the incision is made on the upper side at or near the junction with the uterine body. Here again the operator should be careful to make the opening sufficiently large to prevent tearing the edges of the wound.

The pigs should be removed through this one opening as rapidly as possible, also removing all of the loose fetal placenta. The attached membranes should be left to be discharged through the vaginal opening. The blood clots should now be removed from the edges of the uterine wound and the opening closed with sterile suture. A double row of continuous sutures gives the best results. It can be done more quickly than the interrupted sutures and lessens the handling of the parts.

The entire mass is flushed with the sterile saline solution and replaced within the abdominal cavity.

I usually suture the peritoneum with a continuous suture and close the skin and muscle wound with an interrupted tape stitch.

I think that an injection of tincture of iodine into the external wound often overcomes a tendency to subsequent infection.

The patient is returned to the pen and kept away from her pigs

for a few hours, until she is entirely from under the influence of the antiseptic.

The operator should endeavor to perfect his technique so that he can operate rapidly and with as little handling of the parts as possible. This will add materially to his success.

If the veterinarian's clients are properly approached they will co-operate with him and most of these cases will be brought to the hospital. This alone adds to the success of the operation.

The fact that the operation can be completed within an hour, and a larger number of live pigs delivered, appeals alike to the veterinarian and owner.

Except in rare cases, Caesarian section is certainly far superior to any other method of handling dystokia in the sow.

A CORRECTION

To the Editor:

I wish to call attention to page 285, vol. LVI, n. s., Vol. 9, No. 3, December, 1919, of the JOURNAL, paragraph 3, line 8. The first figure in this line, namely 5, should be 8. Inasmuch as the strength of tuberculin is in our view dependent upon the provision of sufficient surface for growth of the bacillus, it seems that this mistake is of considerable importance and should be recorded.

M. DORSET.

ABSTRACTS

SPONTANEOUS RUPTURE OF THE UTERUS IN A SOW. J. A. Hofmann in *Berliner Tierärztliche Wochenschrift*, vol. 35, pp. 125-126, April, 1919.

Spontaneous rupture of the uterus seldom occurs. In a sow, not quite 11 months old, delivery was hindered. One live pig was wedged into the narrow pelvis; three others could be felt through the abdominal wall. The sow showed evidence of unusual labor pain. Normal delivery seeming unlikely, the owner consented to Caesarian section which was made into the right flank. After opening the uterus the pig wedged into the pelvis was taken out alive, but after careful search in the uterus other pigs were not found. Since three pigs had been palpated unmistakably, I searched the abdominal cavity with the carefully disinfected arm and brought out all three. They had been washed out of the uterus and had just died. Their navel chords could be traced to a swelling having the size and color of a rose, attached to the right horn of the uterus. I thought of extra-uterine pregnancy, but found, on removing the afterbirth, that there was a new, transverse tear in the uterus, at the tip of the right horn, through which the fetuses had been extruded, drawing enough of the membranes through to make a swelling at the breach. I shoved this back into the uterus, closed the tear and proceeded as usual in the Caesarian section. The sow recovered and was fattened later.

This case gives conclusive proof of the possibility of spontaneous rupture. The diagnosis of rupture in a sow is hardly possible. Only when the pigs can be easily felt through the abdominal wall, does rupture suggest itself. Labor pains may persist after rupture, especially when this occurs at the tip of the horns. On the other hand cessation of labor pains may have other causes and consequently cannot be regarded in the sow, as an indication of rupture.

W. N. BERG.

NARCOSIS: THEORETICAL CONSIDERATIONS: PHYSIOLOGICAL AND PRACTICAL INVESTIGATION WITH PARTICULAR REFERENCE TO INTRAVENOUS INJECTION OF AQUEOUS SOLUTIONS OF CHLORAL-HYDRATE INTO THE HORSE. Veterinarian Caemerer. In *Zeitschrift für Veterinarkunde*, vol. 31, pp. 169-355, Hefts 5, 6, 7, 8, 9, 1919.

A very extensive presentation of the theory of narcosis and certain practical applications. Charles Jackson of Boston (1805-1880)

is mentioned as the discoverer of the use of ether as an anesthetic. The various theories of narcosis are presented; a general theory to explain the action of different types of narcotics has not yet been developed. Narcosis is a complex reaction, not to be explained by any simple theory. All of the various theories so far developed are based on experimental evidence and are of value.

By ligating the limbs, thereby diminishing the volume of circulating blood, animals require smaller amounts of chloroform for narcosis, and on removing the ligatures, recovery is more rapid.

Koppen distinguishes the five following stages in the action of chloral: 1. Incoordinate movement. Animal staggers and falls. Involved are: cerebrum and centers mediating muscular coordination; cerebellum and medulla. 2. Paralysis of the cerebrum; animal lies on its side. Corneal reflex becomes weak; respiration and heart beat slower. Cutaneous reflexes more acute. 3. Heart beat and respiration still slower; corneal reflex barely detectable. 4. Entire absence of corneal reflex; the tactile hair (whisker) reflex is retained. Respiration very slow. 5. Stage immediately preceding death. The whisker reflex absent. The kymograph registers a fall in blood pressure.

In horses that had been narcotized with chloralhydrate, it was noticed that wounds, infected or not, healed remarkably well; this is ascribed to the stimulation exerted by the chloralhydrate upon phagocytes. For a 400 kilo (900 lbs.) horse 50 grams chloralhydrate are required.

Use of chloralhydrate—This may be administered in the following ways: 1. per rectum. 2. By mouth. 3. Intraperitoneal injection. 4. Intravenous injection. It may not be administered subcutaneously or intratracheally. These various methods are discussed and criticized in detail; author prefers the intravenous injection.

Technic of the injection—The patients require no special preparation. The chloralhydrate must be pure and contain no chlorinated impurities. The apparatus required is of the simplest kind. Salvarsan-injection apparatus is good. A long needle (10 cm., 4 inches) should be used and, of course, the usual precautions must be taken as in any intravenous injection. Author used 7.5 per cent chloralhydrate solutions. This concentration should not be exceeded. This is not irritating; this solution in the eye causes no more discomfort than so much water. The freshly prepared solution is always filtered; warmed to body temperature in a pail of hot water; the solution being in a tightly stoppered bottle. It is advisable to dissolve 60 grams of chloralhydrate (for large horses

75 grams). Since the least dose is 15 grams, i. e., 200 c.c. of 7.5 per cent solution; little effect will be obtained with the first cylinder full (salvarsan cylinder of 250 c.c. volume). Injection of 250 c.c. should require 1 minute 25 seconds. If all goes well keep running the solution into the animal; one cylinderful every two minutes. The casting ropes, belts, etc., are loosely attached to the animal before the injection is begun. All should be quiet; there is no struggling. The injection is continued as long as the horse can stand; he should be assisted to take the dog-position (squatting) and during this time the injection is continued. When the animal lies down or is about to do so, the needle is withdrawn. As the horse slowly slides down on his side, the restraining apparatus is fastened on, no force being necessary.

Observation of the pulse and respiration is not necessary; an occasional glance suffices. After the operation the animal should not be allowed to rise too soon. In 500 such injections there were no accidents. Exceptional was a first case in which the horse was allowed to rise too soon; he staggered and fell, breaking his atlas. When two men cannot hold the horse down it is strong enough to get up and stand. Following figures are for pronounced deep narcosis. Averages:

Dose	51.4 grams
Narcosis begins after.....	4 minutes
Duration of narcosis.....	54 minutes
Animal arises after.....	95 minutes
Time between insertion of needle and animal arising.	99 minutes

In one case an animal was killed by intravenous injection; 340 grams of chloralhydrate were required. Injection of aqueous solutions of chloroform are very dangerous. W. N. BERG.

THE TREATMENT OF PHLEGMON WITH PATIENT'S OWN BLOOD. Middel Dorf. In Berl. Tier. Wchns. 1918. p. 475. Abst. in Monatshefte f. Prak. Tierhk. May, 1919, p. 572.

The subcutaneous (parenteral) injection of patient's own blood will produce protective ferments in the body of the sick animal which gradually dissolve and digest the hypertrophied connective tissue in chronic phlegmon. At the same time through the resorption and digestion of the subcutaneously injected blood, there occurs an active formation of antibodies for combining with the bacterial toxins. The blood (50-100 c.c.) is drawn from the juglar vein and immediately injected subcutaneously. In 13 out of 14 horses suffering from chronic suppurating phlegmon treated with their own

blood there was complete healing after 6 or 7 weeks. The author states that in a short time there was a spontaneous and complete healing of the abscesses and after a few weeks a distinct recession and almost entire disappearance of the swelling and the sclerotic tissue.

L. T. GILTNER.

REVIEW

VETERINARY MATERIA MEDICA AND THERAPEUTICS. By Major Kenelm Winslow, B. A. S., M. D. V., M. D., formerly Assistant Professor of Therapeutics, Veterinary School of Harvard University. Eighth edition, revised, 640 pp. American Veterinary Publishing Company, Chicago, Ill., 1919; flexible cloth. Price, \$6.

The eighth edition of Professor Winslow's standard work on therapeutics has been greatly revised and wholly rewritten in accordance with the ninth edition of the United States Pharmacopœia. Recently approved remedies have been included together with a large number of prescriptions of proved merit. The fact that this work has now reached the eighth edition is sufficient proof of the favor with which it has been received by the profession. The desire of the author to make his book the last word on the subject is attested by the inclusion of a section on biological therapy by Dr. Adolph Eichhorn, who is peculiarly fitted for this work. Further, the author has had the assistance of one of the leading parasitologists of the country, Dr. Maurice C. Hall, in revising the matter on anthelmintics. It is to be regretted, however, that when the author leaves the field of therapeutics to discuss the diagnosis and prevalence of certain diseases, some lapses have occurred. For instance, on page 585, under "Hog Cholera," the author gives the inference that swine erysipelas occurs in the United States, while as a matter of fact this disease has never been proved to exist in this country. Likewise, on page 610, under "Surra," the old method of diagnosing the disease by inoculating rabbits is given, whereas this method is now supplanted in all modern laboratories by the more accurate complement-fixation test. The names of Bang and Theobald Smith appear misspelled on page 539, but this form of typographical error is exceedingly rare. All in all, the profession is to be congratulated in having such a valuable work on such an important subject made available and the publishers are to be commended for the excellent manner in which they have performed their work, particularly in furnishing a flexible cloth cover for a work which will be in such constant use by the practitioner.

J. P. T.

ARMY VETERINARY SERVICE

NEWS FROM THE SURGEON GENERAL'S OFFICE

NUMBER OF VETERINARY OFFICERS ON DUTY

The Office of the Surgeon-General of the United States Army has furnished the following information as to veterinary officers on duty.

Officers Veterinary Corps, United States Army, with temporary rank as authorized by Congress in act providing 18,000 officers until June 30, 1920, on duty on dates shown (1920) :

	January 11.	February 11.
Colonels	0	0
Lieutenant-Colonels	4	3
Majors	35	35
Captains	73	73
First Lieutenants.....	148	142
Second Lieutenants.....	76	72
	<hr/>	<hr/>
Totals	337	326

Officers, Veterinary Corps, Regular Army, with permanent rank under act of June 3, 1916, on duty February 11, 1920:

Majors	7
Captains	16
First Lieutenants.....	21
Second Lieutenants.....	47
	<hr/>
Total	91

TRANSFERS AND REASSIGNMENTS

The following orders of transfer and reassignment have been issued for veterinary officers:

1. Major A. E. Donovan, U. S. A., on expiration of leave, directed to proceed to Chicago, Ill., for instruction in meat inspection. Major Donovan's orders to proceed to Vladivostok for duty as Chief Veterinarian, American Forces in Siberia were revoked by the War Department after orders had been issued withdrawing these forces from Siberia.

2. Major G. A. Hanvey, U. S. A., from duty in the Surgeon General's Office to Honolulu, Hawaiian Department, for duty as Department Veterinarian. Major Hanvey has been on duty in the S. G. O. as officer in charge of meat and dairy hygiene section and this section has been placed in charge of Major G. H. Koon, U. S. A., who recently reported to the S. G. O.

1. Captain R. A. Kelser, V. C., on duty at the Army Veterinary Laboratory, Philadelphia, Pa., is authorized to make not to exceed three trips per month to Front Royal, Remount Depot, Virginia, for the purpose of conducting experimental work with infectious diseases at that station.

2. Captain E. J. Cramer, V. C., from Chicago, Ill., to Ft. D. A. Russell, Wyoming, for duty as Post Veterinarian.

3. Captain G. W. Brower, V. C., from Chicago, Ill., to Camp Dodge Remount Depot, Iowa, for duty as the Veterinarian.

4. Captain V. B. Wright, V. C., from Remount Depot, Ft. Keogh, Montana, to Chicago, Ill., for instruction in meat inspection.

5. Captain F. R. Harsh, V. C., from Camp Lee, Va., to Camp Furlong, Columbus, N. M., for duty as Camp Veterinarian.

6. Captain H. Z. Homer, V. C., from Camp Bragg, N. C., to Chicago, Ill., for instruction in meat inspection.

7. Captain L. E. Case, V. C., upon the arrival of Major G. A. Hanvey, at Honolulu, is relieved from duty as Department Veterinarian and directed to proceed to the United States and report to the Adjutant General of the Army for instructions.

8. Captain B. C. Bridges, V. C., from Remount Depot, Ft. Keogh, Montana, to Camp Stephen D. Little, Nogales, Arizona, for duty as Camp Veterinarian.

9. Captain R. P. Kunnecke, V. C., from Remount Depot, Ft. Keogh, Montana, to Camp Lewis, Washington, for duty as Assistant to the Camp Veterinarian.

1. First Lieutenant M. F. Severovic, V. C., from Remount Depot, Camp Travis, Texas, to Camp Grant, Illinois, Remount Depot.

2. First Lieutenant C. W. Mould, V. C., from Ft. Huachuca, Arizona, to Chicago, Ill., for instruction in meat inspection.

3. First Lieutenant L. G. Weisman, V. C., from Chicago, Ill., to Ft. Huachuca, Arizona, for duty as the Post Veterinarian.

4. First Lieutenant J. G. Conroy, V. C., from Camp A. A. Humphreys, Va., to Camp Harry J. Jones, Douglas, Ariz., for duty as Assistant to the Camp Veterinarian.

5. First Lieutenant A. D. Martin, V. C., from Chicago, Ill., to Camp Lee, Virginia, for duty as Camp Veterinarian.

1. Second Lieutenant H. I. Stanton, V. C., from Camp Harry J. Jones, Ariz., to Ft. Huachuca, Arizona, for duty as Assistant to the Post Veterinarian.

RETIREMENT

Lieutenant Colonel Richard H. Power, V. C., was recently retired, with the rank of Captain, which he holds in the Regular Army, as a result of disability incurred in line of duty. Colonel Power, as a veterinarian of Field Artillery prior to 1916, resigned from the Army and stayed out for about a year and with this exception has served continuously since 1903. He holds an enviable record for

service. He was stationed at Ft. Riley, Kansas, at the time of the organization there of the present Cavalry School, then known under the name of "The School of Application for Cavalry and Field Artillery." He was made an instructor in Hippology when the school was organized in 1903, and served as such until 1905. While there in co-operation with Veterinarian Alexander Plummer he compiled the first Army textbook known as "The Army Horse in Accident and Disease," which was the textbook used by the students detailed to the school. He saw service in the Philippines, Canal Zone, and was a member of the expeditionary force that landed at Vera Cruz, Mexico, in 1914. While with the expedition at Vera Cruz, Mexico, he sustained an injury to his knee which is understood to have been the direct cause of his disability. He was one of the first officers to see service in France and served as Medical Supply Officer in charge of veterinary supplies; later with the First Army School and then as Corps Veterinarian, Third Army Corps, and prior to his return to this country was promoted to the grade of lieutenant colonel. He also served as Veterinarian of the Le Mans District. Upon returning to the United States he was assigned as Veterinarian, Remount Depot, Camp Pike, Arkansas, and served in this capacity until his retirement.

Dr. J. F. Winchester of Lawrence, Mass., one of the "Old Guard" of the A. V. M. A. has been recently elected to membership in the famous Authors' Club of London, an organization which includes many noted literary men of the English-speaking world.

Doctor F. W. Lewis, of Minneapolis, Minnesota who has been in Russia for the past year is now enroute to Siberia for another year.

ASSOCIATION NEWS

Proceedings of the Fifty-Sixth Annual Meeting of the American Veterinary Medical Association

Held at the Hotel Grunewald, New Orleans, La.,
November 17 to 22, 1919

(Continued from the February number.)

TUESDAY MORNING, NOVEMBER 18, 1919

SECTION ON GENERAL PRACTICE

The meeting was called to order at 10 a. m. by Dr. A. S. Cooley, chairman of the section.

THE CHAIRMAN.: Not knowing whether it was customary for your chairman to present a paper, and yet thinking that perhaps you might expect it, I have prepared a short paper, based on my experiences as a practitioner.

(The chairman read his paper, which follows.)

Every veterinarian discovers sooner or later that the practice of veterinary medicine has two sides, "a greater scientific side and a lesser but important personal side." It can be said with reference to these two conditions cited that to fight the battles of life in veterinary medicine, it is necessary for even the most scientific physician to have professional tact and business sagacity. It has been said, and very truly so, that it is among the unsuccessful doctors that the tricks of the trade are apt to stand out. Recall to mind some of these men and I feel you will confirm this fact. But survey the successful veterinary practitioner or doctor as a finished product and I believe you will conclude he makes good by the social tact, persistence, ingenuity and "horse sense" that are born in him or acquired in his pre-professional boyhood. His training is such as to make him enter into the interest of his clientele for their welfare. The activities of his community should and do demand his attention. "He who does not show himself is overlooked." Continuing along the thought of veterinary medicine having two sides. You practitioners and members of the A. V. M. A. will agree that there are men in our ranks who are perfectly acquainted with all scientific aspects of veterinary medicine who can tell us what to do for almost any ailment, yet these men, after earnest effort and trial, have failed to achieve success or reputation, or acquire practice, because they are deficient on the personal side.

It is my pleasure to come in contact with teachers and scientific men whose character has a clear outline. It has always been a great teacher for me to come in contact with these leaders in veterinary medicine. We are told that one learns in two ways, by experience and by imitation of good morals, and we, as practitioners, must

assume our part in this association by not letting it assume too much of a scientific aspect or by drifting from the direct interests of the practitioner. The latter is the field man, who is most always the first on the job and to whom we must look for the first report to be given the authorities, in guarding against danger. He must be a quick observer for the interests of his clients. He must give prompt advice to his clients, being alive to their welfare and giving first aid in the matter of live-stock diseases. Therefore, to perform this function properly, beware of mistakes at the outset, basing your opinion on personal and scientific qualifications. "Where there is nothing great to be done, a great man is impossible."

The practitioner forms the greater part of the membership in this association and as such he is the man out on the skirmish line or in the first line trenches who is in a position to assist in live stock health crusades. It is satisfying to see this becoming more and more the fact. I believe it is our duty to be active, so far as our work as practitioners will allow, in making the live stock industry economically safe to pursue. The community having the best human and animal health is the prosperous and happy one. The veterinarian who assists in this happiness is the person in great demand in the stock community.

Considering some of the factors of success I believe if, before entering practice or on changing locations, you were to ask an old practitioner how you could get patients to treat, he would say, "one gets patients and more patients by being faithful to the few one has." Thoroughness and care and service give confidence.

Another man acquires a large and lucrative practice by "gift of gab," flattering himself, telling what he did. Yet, I believe this kind of success is growing less and the public is saying "show me." "An eagle's life is worth a world of crows." Another set of men acquire a place in the community because they get hold of new ideas, or transplant old ideas to new places.

We might take up for a few moments the importance of animal health crusades made by the states and other authorities; yet, is not the action taken many times somewhat like the Nation's and states' advice with reference to waste and conservation given to the public? "Do as we say and advise but not as we do." The Nation and state ought to be the best illustration of wise avoidance of waste and the best object lesson in sustained industry. They should likewise lead in the conservation of animal health. Can you men not recall the lack of action of states with reference to contagious and infectious diseases? Yet they say to you practitioners, it is your duty to report such diseases to the authorities in lieu of having your license revoked. I know of cases where the centres of infection are protected by allowed injunction, where the practitioner has done his duty. Can you practitioners not recall the lack of action to control rabies by proper dog laws not being enacted? Is it not too often true in our great effort to control tuberculosis, that contaminated milk goes to the creamery and then the dangerous by-product therefrom is

dispensed to the farmer to feed calves and thus rear tuberculous animals to be tested and paid for by the over-burdened taxpayer?

Is it not too often true that possibly in our great effort to lessen the danger of one great disease, that we are spreading another one as much if not more dreaded? Are the channels of commercial traffic in infected animals looked after with the alertness the cases demand? Is the practitioner's test too often made for the purpose of pleasing and satisfying the owner with the properly approved certificate, while the infection is passed on into new territory?

While the veterinary practitioner's prime work is to treat the individual cases, I fear your community will never be satisfied with this alone. It will look upon you for some effort of prevention, some effort for the wholesale destruction of disease. This I believe should demand our watchfulness.

Recall for a moment the action of certain states with reference to the past handling of hog cholera outbreaks. They allowed laymen and farmers to handle serum and virus, men with little or any knowledge of potency or virulency or differential diagnosis, all difficult problems many times needing the careful and skilled practitioner. Again recall the county agent, many of them assuming to be experts in hog cholera work, yet it is pleasing to read that their activities in practice are being gradually curbed.

A word with reference to surgery and then to our work. Can it not be said of this branch of veterinary medicine that the skill in animal surgery is growing, a fact that no doubt many of you men who were overseas can affirm? The vast opportunities offered by the late war must have increased the knowledge in this branch and furnished new thought and surprises to the operating surgeon in charge of overseas duties. This cannot be other than true from the clinical material furnished. This fact I dare say will be brought out in the paper on "Surgical Phases of Army Veterinary Work in France."

THE CHAIRMAN: The first paper on the program is "Intussusception of the Intestines," by Dr. J. N. Frost, Ithaca, N. Y.

(Dr. Frost read his paper, which is published in this number of THE JOURNAL.)

THE CHAIRMAN: Gentlemen, I feel that the great majority of those present are practitioners or teachers, and if it be your desire we will allow the discussion of this paper to proceed at once. Dr. Frost is here to answer any questions you may desire to ask that will be of benefit to you in field work.

DR. J. F. DE VINE (Goshen, N. Y.): I would like to ask Dr. Frost that he mention what material he used for suture. I would also like to ask him the percentage of recoveries, and particularly with reference to early operation as compared with operating later.

DR. FROST: I intended to say that in suturing we use silk sutures. Some people use catgut in suturing the intestine, especially the first suture, but I am always afraid to use catgut, because it is quite liable to be absorbed, and so far have found no disadvantage in using the

silk suture. I have used linen in some cases and have had very good results. I think, however, the silk suture is the best to use.

With regard to the early diagnosis and percentage of recovery, most of the cases on which we have operated have been cases that have run 3 or 4 days. We have had, so far as the operations are concerned, no cases to operate that have run less than 3 days. They have all been what you might term old standing cases. We have had some cases where we were able to remove the intussusception by manipulation of the rectum where the cases had gone 4 days.

I remember particularly one case. This animal had been dosed for impaction, given salts and molasses until the rumen was like a bag of water; you could press against it and hear it splash. We found intussusception back of the rectum. By careful manipulation we got it straightened out. In a very few minutes after our manipulation the cow began to pass liquid feces and soon became all right. I think it is safer, however, to operate rather than to attempt to do much manipulation per rectum, because you can't tell how easily it can be expressed, and the percentage of recoveries apparently is very good.

I can't tell you just exactly how many cases we have operated on up to the present time, but I think between 20 and 25. We have done the same operation on horses that we do on cattle. We lost 1 horse that we operated on and lost 1 cow that was directly the result of the operation. In that case an abscess developed around one suture, and in opening that suture we accidentally opened one portion of the intestine, and a fistula in the abdominal wall resulted and the cow died two weeks afterwards. Of course that was not the direct result of intussusception operation.

Then I lost one calf in which the cecum was telescoping the intestine; it was 2 months old and showed all the symptoms of intussusception. I made a diagnosis of the intussusception, put the calf down and attempted to operate. I got in there and I didn't find the intussusception. I felt over the small intestine from one end to the other and I missed the portion where the cecum was pressed into the ileum. That calf died a couple of days later, simply because we didn't find the intussusception when we got in there.

DR. WINCHESTER: I would like to ask the Doctor if his diagnosis of intussusception is made after the abdominal cavity is opened and by manipulation of those that exist, or is it made previous to that, and what percentage of those animals die that are not operated upon?

DR. DE VINE: Dr. Frost spoke of using local anesthesia. I don't think he made it clear whether the local anesthesia was used for the cow, or the horse also. In other words, would Dr. Frost think it advisable to operate on a horse in the field with the application of local anesthesia? Also does he use the suture in the skin the same in the horse as in the cow?

DR. FROST: If I understood Dr. Winchester, he wished to know if we make the diagnosis after or before opening the abdomen. Generally you can make it before, but sometimes the diagnosis is

made afterward. What I consider the symptoms of intussusception are violent colic, increase in pulse, normal temperature, passage of no feces or very small amount of feces; if there are any they are covered with mucus and blood; or you simply get a mass of mucus, perhaps streaked with blood; and that, to my mind, gives you your diagnosis of intussusception. If you are not positive it is not going to do any great amount of harm to open up the abdominal cavity, provided you are halfway clean; and after you do that you can cinch your diagnosis at that time. If you get mixed up on the diagnosis, you haven't harmed the animal by opening the abdominal cavity. You can suture the cavity. That applies particularly to the cow. With the horse, of course, there is greater chance of peritonitis developing.

In regard to the percentage which die, which are not operated on, I don't know. When you come to look up the literature on this subject you don't find much about it, and in all cases in which we had any suspicion we have operated. I presume a big percentage would have died if we hadn't. As I said, there are records where adhesion has occurred and a portion of the intestine sloughed off and recovered, but I imagine the percentage of recovery in such cases was small.

In regard to Dr. Devine's question on anesthesia. In the horse it would be better to use general anesthesia, but with a cow I hate to give general anesthesia, but give chloroform if I am afraid of inhalation pneumonia. A cow doesn't take it as well as a horse, and you can get along without it, and I think the chances of recovery are better without. When you are through with the operation the animal relaxes and is ready to walk off.

Now in regard to suture. With horse or cow we use practically the same. There is no difference so far as I know. In human work with this operation—they call it anastomosis—instead of end to end, lap over and suture one side of the intestine to the side of the other portion. That hasn't any great advantages; in fact there are disadvantages. The only advantage it has is that in the human the intestinal lumen is small. There is greater danger of stenosis. With the larger domestics there is no danger of that; less danger of infection; less danger of adhesion; so I see no reasons for performing the latter. Anastomosis you would find frequently, in the cat and the dog, as in the human, because it is smaller. In regard to the suture, we use the same suture the same way, in the skin—the mattress suture. In the small animals you can do as in a human.

THE CHAIRMAN: The next paper is on "Caesarian Section in the Sow," by Dr. J. N. Gould of Worthington, Minn.¹ Is Dr. Gould present? If not, is Major George B. McKillip present? If those men are not present, is there any matter that you want to discuss in this section? If there is no further discussion in this section, we will go to the other sections where we can get something. It seems to me that the practitioner who is active must interest himself in the

¹ This paper is published elsewhere in this number.

meetings of the American Association very acutely, that as practitioners we don't enter into the activity of the Association, perhaps, as much as we ought to.

DR. W. H. HOSKINS: Mr. Chairman, as the program seems to have been thoroughly exhausted, there is a matter that I thought possibly had better come up in this section than in any other. On the 30th and 31st of October there gathered in New York a group of men who formed themselves into the Horse Publicity Association of America. These men represented all of the different horse-breeding organizations of this country; they represented the humane organizations of this country; they represented chambers of commerce; they represented all the National and state hay and feed associations; they represented the American Saddlery and Hardware Association, the American Wire and Nail Company in the manufacturing of horseshoes and of horseshoe nails. They represented the Saddlers' Association, the harness manufacturers and the wagon builders of this country. They met there for the purpose of discussing the bringing back of the horse to a larger extent in the field that he should properly fill. They have organized a national association with a board of directors of 24, representing these 22 allied interests, the humane associations and the veterinary profession. A number of us attended the meeting and took part in its deliberations. There were gathered there on the night of October 30, at a banquet in that city, 600 men and women interested in bringing the horse back into his proper sphere of service. They purposed to prepare statements of facts that the auto-drawn vehicle cannot economically displace the horse within a radius of 12 miles. Beyond that, auto truck power can transport goods and enter commerce profitably.

They purposed to show the relative cost of an auto truck and a pair of horses and the necessary equipment, and to present these facts, through chambers of commerce and through extensive advertising, all over the United States. There is an abundance of evidence that the advent of the auto truck has added very materially to the high cost of living. One of the great packing interests has shown that the cartage of 100 pounds of their products adds 25 cents to the cost of those products. When carried by horse power, four, two or one horse-drawn vehicles, the relative cost is 13, 9 and 5 cents.

I think most of us realize that when this period of inflation which we are passing through will burst like these bubbles have always bursted in the history of our country and we get down to counting the cost of things by cents rather than by dollars, it will become an absolute necessity to bring back the horse in the large cities and in commerce for the purpose of reducing the cost of all the articles that enter into our living.

We have sat idly by and watched State after State spend millions and millions of dollars upon highways that have practically driven the horse-drawn vehicle off the public highways and roads. We have failed to demand, as taxpayers and those with a selfish interest, that these roads would be in part in the shape of side roads, con-

structed so that the horse-drawn vehicle might go along those roads with safety and perform its services.

No one has yet invented a tractor that can do the work on the average farm as economically as horses may do it, and I think there is no body of men that have a more selfish interest in this movement to restore the horse to the sphere in which he properly belongs than we have, and I trust this Association will take membership in that horse publicity association. It already has a representative on the board of directors, and we will enter into the work of restoration in all of the States that are constructing these highways, to see that they have provision made for the safety of horse-drawn vehicles by side roads. No one thing has entered so largely into the enormous budgets of States than the construction of State highways, and neither the Federal nor any State government has yet successfully built a highway that will stand the wear and tear of one, three and five-ton trucks.

Pennsylvania recently decided after a period of more than 20 years, without any public indebtedness, to borrow \$50,000,000 to construct highways. This year in New York they will spend \$20,000,000 to repair the \$150,000,000 worth of highways that have been constructed almost entirely for the use of automobiles and auto trucks. I feel that we ought to be very keenly interested and enter into this movement in our respective States, for it is nationwide in its purpose, and give all the assistance within our power to promote the work of this publicity association and to bring these facts to the horse owners and to the public. They may realize what a tremendous factor the advent of the automobile has been in the high cost of living, and not only that, but in the destruction of public morale in most communities.

THE CHAIRMAN: Without dwelling upon this question, which is perhaps a little foreign to our program, still of vital interest to the public, the letter of the Wilson Company in the *Breeders' Gazette* was a very instructive article with reference to the influence of the truck. There has been a great deal of talk pro and con on the high cost of living, and I don't know that we want to discuss it very greatly here, although I am not going to take the opportunity from the floor if you want to discuss anything that Dr. Hoskins said.

We have some men with us whom I shall call upon to talk on the question of surgical phases of army veterinary work in France, and I am sure you will be glad to hear from them.

DR. WM. HERBERT LOWE: Before taking up another subject, might I be permitted to refer to Dr. Frost's paper just for a moment?

THE CHAIRMAN: We will allow you this chance, Doctor, although you are a little behind.

DR. LOWE: I know I am a little behind, although I have been considering the subject since. In dealing with live-stock problems of course we have to consider the economic as well as the surgical point of view. I would like to ask Dr. Frost in what cases, from an economical standpoint, he would advise surgical interference and in

what cases he would not. Of course in valuable stock I realize that in purebreds this is essential, but in dealing with grade cattle there may be times in the early stages when it would not be advisable. I would like to ask Dr. Frost to discuss that point further.

DR. FROST: It is like with any other operation. If the animal isn't worth the price of the operation, better not do it; but it is an operation that doesn't require much after-care. If the animal is worth as much for meat as she is for milk, probably the best way would be to slaughter that animal. Undoubtedly she would be all right for meat. In case of a steer, his only value is the meat, and it would be better to slaughter him than to attempt the operation. But if you have an animal in milk or well along in pregnancy, I think it would be well to operate. We operated on one cow with two months' pregnancy. She went along and gave a nice calf and did better after that operation than she had before. Another cow we operated on—a grade cow—had been pregnant only a month; she aborted after the operation, and went off on her milk after aborting and was finally killed for beef. As I said, you simply have to use your own judgment.

THE CHAIRMAN: I learn that we have with us—I don't know just the title that has been given to these gentlemen in army life—Dr. Frazier, Dr. Carpenter, Dr. Merillat and Dr. Hilliard. I am going to speak of them as Doctors, and I am going to call on Dr. Frazier first, to give us a short talk along the topic "Surgical Phases of Army Veterinary Work in France." He perhaps can give us something very interesting.

(Dr. Frazier and Dr. Carpenter were not present.)

DR. MERILLAT: As I am listed on the program to discuss a formal presentation of army veterinary matters by Col. Bemis, you will have to excuse me from making any general remarks on the Army Veterinary Service at this particular moment. As regards the surgical phases of army veterinary work, I can dismiss that subject in a very few minutes because largely there was no such animal in France (laughter), and although I went into the Army because somebody thought I was a surgeon, I want to confess to you here, publicly, that the only surgical work that I did in France was to help my lieutenant. Besides that, I never had a knife in my hand because we had to think about thousands and not about individuals in the particular position into which I was unfortunately thrown in the service.

The conservation of an individual subject among 95,000 horses, which was the number of animals in the 1st Army, is not a big problem of war. If all the quitters and all the shell-wound horses and all the treads and nail wounds and corns, etc., died, that would be such an insignificant matter that nobody paid any particular attention to surgery under the conditions in which veterinary work was operated in France. Those who had charge of veterinary hospitals in the war, some months after the armistice, did begin to in-

dulge in a certain amount of surgery, and it is to them that you will have to refer to discuss the matter of surgical phases in the war.

My first assignment in France was to take charge—that is the way the order read—of the veterinary hospital at Neufchâteau, which is located a few miles west of the battle line's run from Toul to Ft. de Jouy, and was selected as the first place to establish the American veterinary hospital. It had been an old French veterinary hospital, built by the Germans during their days of occupation after the Franco-Prussian war as artillery barracks, but during this war the French had created an immense veterinary hospital there, and when the Americans took over that sector they turned it over to our Army as our hospital. I never was in charge of that hospital because I didn't have anybody to command there except veterinary officers. The commanding officer was a captain in the cavalry, and I was the good-natured adviser of this gentleman, so whatever happened there I do not entirely place myself responsible for.

However, having the spirit of professionalism foremost in my mind, and having no knowledge of military matters, I tried to develop a veterinary hospital and particularly a department of surgery, and did equip the place with all the appurtenances that should go with such a place, and intended, of course, to run this place on strictly scientific and technical lines; but other excursions overwhelmed me so that I forgot all about poll-evils and we concentrated our minds in trying to save the great body of horses and not pay so much attention to the few individual horses with surgical intervention. That is what I should call the surgical phase of my experience in France.

There were a certain number of operations performed by Lieut. Kline, particularly cases of paraphimosis. It seems that paraphimosis was about the most common surgical condition that was encountered among the animals of the Army in hospitals. Just why so many animals were victims of this disease I never was able to say positively, but it was a fact that a great uncomfortable number of the animals afflicted with mange and general debility and lymphangitis—ulcerated lymphangitis—did also fall victims to paraphimosis and very few of the cases recovered without surgical intervention. Lieut. Kline, during my sojourn at Neufchâteau of two months and a half, operated on quite a few cases, performing the operation of circumcision, which Dr. John Adams has described to this Association a number of times, with very good success. The other surgery that he indulged in was largely the treatment of wounds that happened in the hospitals. You will remember that at this time the American Army was not fighting. It was during the months of January, February and March of 1918. It was just getting ready and had none of the diseases of action to deal with. We had no wounded animals to look after.

Veterinarians who took over the veterinary hospitals after the A. E. F. went into action would be the ones that should discuss the

surgical phases of war, and Major McKillip, whose name is listed as a contributor here, would be one of the men who would be able to discuss this in greater detail. I might, however, having had my greatest experience with an army in action, say a word or two about surgery at the front. Here is another thing that didn't exist in the A. E. F., that was one of the greatest contentions of Hilliard all the time: "Why in the world don't you do something with these horses before you send them back here?"

The unit veterinarians attached to an organization should, of course, treat horses, but you will be surprised, if ever it is your misfortune to have the experience, how very little treatment he is able to administer. He is operating under such conditions that the treatment of the animal is almost impossible. It is very difficult to diagnose a nail wound in a horse standing in mud up to his ankles, knees, or sometimes stifled, where there is no water, no means or anything to wash it off to see what the trouble might be. Consequently we find this veterinarian sending the incapacitated horse to these mobile sections, and the mobile sections being located in a place not much better than the organization itself, and being a mobile organization, doesn't do much; so he passed it back to the corps if he is able to walk, and if not, he will shoot it there. The corps, being located a little more permanently than the division was, back away from danger, might, if they were inclined, sort out, diagnose and treat some of these animals. Unfortunately they didn't do that in France either, so they sent that back to the Army, and that is where they found Merillat.

We tried to receive, classify, diagnose, reissue or evacuate the animals that came to us. During the battle of the Argonne this number was just exactly 23,000, and I started in with 68 men to do it. I wound up with something like 1,200 men to do the work that I was supposed to do with 68 men in the first place. You know we didn't have much time to do much sorting, treating and arranging of animals in the Army during the first days of these battles, and of course I did like the rest of them—I tried to find cars as quickly as I could to give them to Hilliard to let him do as he pleased. What he did, I don't know.

We learned this lesson: that it requires a big personnel to look after animals in an army. It takes a good, well-trained organization to keep this big machinery moving, from a unit veterinarian away up in the woods, down in the valleys in the mud, where the horses are working, to the veterinary hospitals, away back 200 miles in the rear. To supply transportation, proper means of care, the necessary isolation and classification to prevent disease from spreading to all animals, requires a personnel that no officer in the United States Army had thought about when we went to the war with Germany.

The army evacuation stations, which during October were becoming such a great problem, with some 1,200 men operating them, were placed under the command of Major Nolan of Canada, a

very able man. He, with no other occupation than to command the evacuation stations, one of which was placed behind each corps, built out of lumber that he got out of the air, and stoves that he stole from shell-shot buildings, and other needs that I never knew where he got, but I always accused him of being a porch climber in civil life, because he sure did build some remarkable buildings out of nothing. He had a capacity built along the Aisne River for some 1,200 animals that he put under cover, and being located along the railroad, he sent them back to Major Hilliard at the veterinary hospitals. He planned out a very fine system of animal care; had wards for mange, influenza, lymphangitis, surgical cases; had blacksmiths take shoes off all horses, wash their feet, examine for nails, corns, and trivial conditions, and there did the best surgery that I saw done in France—that I *saw* done in France, remember.

I do not know what was done in veterinary hospitals. So active was Major Nolan in these evacuation stations that in two weeks it was necessary to establish a convalescent zone to take care of the animals that we decided it was not necessary to send back. So we got a 2,000-acre farm across the river from Verdun. We placed the surgical cases on it. Many a horse went back to the firing line without going to Hilliard at all. The others that had mange or were incapacitated more or less permanently were loaded on cars when we could get them and sent back to the rear.

So the surgery in war in an active army is not very much. No man at the front would indulge in major surgery. Such refinement could only be developed back where there is nothing to bother them, back in the Service of Supply, where work can be done more deliberately. Although my remarks here would tend to show that the American veterinarian didn't do much surgery, I want to assure you that if the war had lasted a little longer this chain of veterinary hospitals that were developed would have been found doing all kinds of high-class veterinary work. It was just beginning. You must remember that we were too late in getting our force over there, that the war was over before we had anything like an adequate means of looking after our animals. It seemed to have been the thought that we didn't need much veterinary service. Although we had a big army coming, we started the veterinary hospital with 700 horses—and here I want to tell the first joke on the A. E. F.

When I went to Neufchâteau the capacity of the hospital was 100. There were also some French organizations that were left behind, occupying some of the buildings for kitchens, so the actual number of stalls in Neufchâteau was 700. Major Hilliard never would tell me anything—secretive pill! There were about 20,000 horses at headquarters. The horses were in bad shape; they were mangy and hadn't had much to eat and were located in little villages all around Neufchâteau. It seemed that the men who had these horses in charge were pretty sick of them. They didn't look like horses; they looked like Mexican dogs. The disease was pretty general all around. Of course there were a few veterinarians located there, but

somebody sent out a telegram to the commander, "Send your sick horses to Neufchâteau." I think about 20,000 started on all the roads to Neufchâteau, and I had room for 700 of them. Well, it took quite a little while to undo the damage of that telegram. That, gentlemen, was the result of lack of organization, lack of any kind of common knowledge of what veterinary service is.

That is all on the subject, gentlemen. Thank you very much, Mr. President.

THE CHAIRMAN: In view of the fact that the gentleman to read that paper is not present, and we are all wishing to hear from some of these men that are present that are not on the program, I am going to call upon Dr. Carpenter to relate some of his experiences, without confining him to this, for a few moments. I know we will all be glad to hear from him.

(Dr. Carpenter was not present.)

THE CHAIRMAN: We will call upon Dr. Hilliard, to whom Dr. Merillat referred, if he is here.

DR. HILLIARD: As far as any surgical phases in the Army veterinary work in France were concerned, the only surgical work that came to my attention was operating on some 250 officers and 10,000 men, sometimes giving the young officer another leg to stand on, and sometimes cutting off a limb. As far as my work was concerned, it was all administrative; no surgical work at all.

Adjournment.

SECTION ON SANITARY SCIENCE AND POLICE

The meeting of this section was called to order at 9:45 a. m. by Dr. L. E. Day, chairman.

THE CHAIRMAN: Although the program does not provide for an address by the chairman, or by the secretary, those things have been more or less customary and I presume that you will be expecting something of that kind. I have prepared a very short address. I am not going to burden you with any great, long drawn-out, fixed address, as those things, you know, usually become very tiresome. I wish, however, to take this occasion to thank you for the honor that you bestowed on me last year. We have worked very diligently, that is, your secretary and I, in order to get a large amount of material for this particular section, and while it is very gratifying to us to know that he has obtained a great deal, it is rather disappointing in the end for us to know that he has furnished such a large amount of material for the other portion of the program. However, be that as it may, we are always glad to lend assistance wherever assistance can be used to advantage.

(Dr. Day read his address, as follows).

Each year the Association is confronted with problems to solve. Some are new and others are old ones which present themselves in a new form or under different conditions. Last year at Philadelphia the question of a new section of the Association was brought up. This new section was to be one designated for the Bureau of Animal

Industry members of the Association and others interested in State and municipal work along parallel lines. Such a section, to my mind, would be ideal as it would provide a means whereby members of that particular branch of the profession could meet and discuss their problems. The A. V. M. A. has always been very generous in trying to meet the requirements of the times in general and of its members in particular, and I feel quite sure that as soon as the interest in this new move is sufficiently strong a section for the convenience of this branch of the profession will be established.

Much work along lines of sanitary science and police has been done in the past decade, which has yielded wonderful results. We can hardly read any of the current scientific literature dealing with any branch of medical science without having this fact brought very forcibly to our minds. The war waged against the great white plague, hog cholera, Texas fever and scabies or other form of parasitic diseases is only one of the many examples of the trend toward this important branch of the work.

The study of parasites and parasitic diseases has remained somewhat dormant until a few years ago when it was again revived. Since then, research work has been extensively carried on along certain lines of study, especially on the action of anthelmintics.

Investigations directed toward the study of the life cycle, habits and pathology of the ascaris in swine have been pursued quite vigorously during the past two years by the Zoological Division of the Bureau of Animal Industry, and much valuable information has been uncovered.

Some of the more recent investigations show that these parasites cause great losses in young pigs ranging from two or three weeks to six months of age. Formerly it was believed by most parasitologists that the life cycle of this parasite was completed in the intestinal tract of the host, and that it did but little harm unless it was present in numbers sufficiently large to disturb digestion or by clogging the lumen of the intestine.

Investigations now show that this former assumption concerning the life cycle was not well founded. It has been proved by observation and experiment that the first stages of the development of the embryo are spent in the lungs where it sojourns for ten days to two weeks. During this time it causes great destruction to the lung tissue and in many instances causes death of the host by croupous pneumonia. If the parasites are not numerous enough to cause death much distress and impaired growth is the result. Since this parasite is so widespread throughout the hog-raising section of this country it has been estimated that perhaps the loss in little pigs from this source alone is as great as that from hog cholera.

Much work remains yet to be done concerning the control of this parasite. The eggs in infected pens are extremely resistant to disinfectants, so much so that they will live for days in most of them, and they are also extremely resistant to thermal changes. Many well planned experiments are under way toward the eradication of this

parasite from the infected premises, and I believe that some tangible way will be discovered to accomplish this end.

I have noticed many pigs from one to two or three months of age on infested premises to be unthrifty, their hair is long and rough and the animal is very thin in flesh. Whenever a postmortem is held on such animals a few ascarids are usually found in the intestinal tract. The mucosae of the intestines of such animal oftentimes contain small superficial necrotic areas, a condition which has been designated necrotic enteritis and thought to be due to the *necrophorus bacillus* by some.

We know that these parasites produce an irritating substance and it would appear that possibly this may cause a superficial necrosis of the lining of the intestine. Investigations along this line might assist in clearing up the etiology of this condition.

The thorn-headed worm (*Gigantorynchus hirudinaceus*) is a very common parasite of swine intestinal tract and causes much loss in young pigs, not only by causing unthriftiness of the host but by death from peritonitis resulting from the perforation of the intestine.

Figures gathered from one of the large packing plants in Chicago show that probably 70 per cent of all of the hogs slaughtered are affected, more or less, with this parasite, and that about 20 per cent of the hog casings are so badly affected that they are a complete loss to the packer. This item alone is of much importance when we consider the number of hogs slaughtered. There are about 40,300,000 hogs slaughtered under Federal inspection in this country annually. Hog casings that measure 18 feet when cleaned and prepared for use are worth ten cents at the present market price. If 20 per cent of the total slaughtered are a complete loss we find that the loss in dollars would amount to about \$806,000 per year in the loss of casings alone, to say nothing of the loss occurring in the hogs themselves.

While we feel that we have a fairly good knowledge of the life cycle of this worm, further investigations might be of great value in helping to combat this pest.

THE CHAIRMAN: The next thing on the program is the report of the secretary, and I will ask for his report now, if he is ready to make one.

Dr. H. Preston Hoskins, secretary, read his report, as follows:

FELLOW MEMBERS:

Section 1 of Article 12 of the Constitution and By-Laws provides that the Association shall be divided into the following sections:

A—General Practice.

B—Sanitary Science and Police.

C—Veterinary Colleges and Examining Boards.

The Executive Board may make additional sections as deemed expedient.

Section 4 provides that the secretary of each section shall keep an accurate record of the proceedings of the section. He shall, in

cooperation with the chairman, arrange the program of the section for the annual meeting. He shall send the program to the secretary of the Association at least forty days before the annual meeting for insertion in the program of the Association.

I would like to call to the attention of the members the fact that it is very difficult, indeed, to draw a distinct line between the work of the two sections (A and B) as they are at present constituted. The trend of veterinary science is more and more in the direction of sanitary control work, and there is hardly a practitioner in the country today whose daily work does not bring him into contact with one or more of the infectious diseases which are prevalent throughout the land. I have in mind such diseases as hog cholera, infectious abortion, tuberculosis, blackleg, anthrax, hemorrhagic septicemia and Texas fever. While questions dealing with the spread, prevention and control of these diseases very properly come within the scope of sanitary science and police, show me the general practitioner who is not intensely interested in these questions.

The suggestion has been made that a section for the Bureau of Animal Industry veterinarians be provided for. It is the opinion of your secretary that the interests of the Bureau men are identical with those of the members who would constitute the section on sanitary science and police as provided in the constitution. If we are to have another section in the Association, I would prefer to see it devoted to animal pathology and bacteriology, having in mind the more technical side of some of these questions. Such a section would offer the proper time and place for the laboratory men to come and discuss their problems. These papers and discussions rarely prove interesting to any except those of us who are actively engaged in these more technical subjects.

Under the present arrangement it is no easy matter to arrange a satisfactory program. In accordance with the very plain provisions of the constitution and by-laws, the officers of this section, both this year and last year, proceeded along very definitely outlined plans to arrange attractive programs for the section on sanitary science and police. In due time these were turned over to the secretary of the Association, to be embodied in the general program. As was the case last year, so it proved to be the case this year, the papers solicited for this section were scattered throughout the program in such a way as to make unrecognizable the section program as it was originally arranged.

It is not my intention to criticize anybody for this, as it is quite likely that it was necessary to do it, in order to balance up the program. On the other hand, I believe it would be well for those who are selected for the officers of sections for the ensuing year, to have a definite understanding as to the ground to be covered by each section, the number of separate and joint sessions to be held, and any other matters that would tend to prevent overlapping of subjects or unnecessary duplication of effort.

In closing I will take this occasion to thank those who have so

willingly responded to our requests for program material. If you were a little disappointed, when you saw the program, because your paper was not placed where you thought it would be, I ask your indulgence. Any changes that were made in the program were made for one reason, and one reason only, namely, for the good of the Association.

THE CHAIRMAN: There being no committees to report, we will now proceed with the scientific portion of the program. The first paper will be that of Dr. Seymour Hadwen, of Ottawa, Canada, on "Swamp Fever."

(Dr. Hadwen then read his paper which was published in the JOURNAL for February, 1920).

THE CHAIRMAN: The next paper is a "Comparative Study of the Long Bones in Infectious Equine Anemia and other Conditions," by Dr. Lewis H. Wright, of Reno, Nevada.

(Dr. Wright then read his paper, illustrating it by a means of slides showing in an explanatory way the disease of bones which were taken from animals shortly after death. This paper was published in the JOURNAL for February, 1920).

DR. BELL: May I ask Dr. Wright what his observations were in microscopic examinations?

DR. WRIGHT: We have not made very many microscopic examinations and I would prefer not to make any positive statement at this time, for the reason that we may have to backwater, as it were, on the same if made now.

THE CHAIRMAN: The next paper is one on "Changes in the Irregular Bones," by myself. This paper is not placed on the program at this time because we think it has any relation to infectious equine anemia, but it is placed here simply because it deals with a change in the marrow of bones of cattle in this case, so I do not want you to think that it was placed here because it has any relation to infectious equine anemia, and I do not think it has.

(Dr. Day then read his paper, which will be published in an early number).

THE CHAIRMAN: The next number on the program is "Experimental Transmission of Swamp Fever in Infectious Anemia by Means of Insects," by Prof. John W. Scott, Laramie, Wyo.

(Prof. Scott then read his paper, illustrating his remarks and address by a series of slides. This paper was published in the JOURNAL for February, 1920).

THE CHAIRMAN: Dr. Fitch, of St. Paul, Minn., is the first one to open the discussion.

DR. C. P. FITCH: It is impossible, gentlemen, in opening the discussion on this subject, to attempt to cover the points that have been raised, and it is not my purpose to do this, but I do think there are several points in connection with infectious anemia that deserve mention.

I believe that, first, the terminology of this disease is somewhat confusing. You will find that there is a great deal of doubt in the

minds of many investigators whether the disease which exists in Europe is exactly the same disease as in this country. I believe a great deal of that doubt is due to the term "swamp fever." Those of us that have had any experience with any disease of the swamps know that the disease called swamp fever has nothing to do with the location of this disease and that it is found in higher latitudes, and I think that we should drop this term and substitute some other name such as infectious anemia.

I believe this disease has failed of recognition in many sections of the country and that it is actually prevalent in some sections of the country unrecognized. My idea is it is prevalent in northern New York. Many declare this disease to be prevalent in the East. During school days, we heard something about swamp fever in our regular course, but we never saw a case; there never was a case in the clinic, and when investigation showed that there was some animal had an infection in the northern part of the State and we were sent there to investigate, swamp fever never entered our minds at all. Finally, after considerable investigation, we found it existing in other portions of the State. So it is my belief that careful investigation would show that infectious anemia is present in a greater section of the country than it is given credit to be, and the papers bear out that statement, because the ordinary stable flies are pretty widely distributed over this country, and if they are capable of transmitting the disease in one section of the country, those possibilities are prevalent in other sections of the country, because flies go some distance and sometimes animals come from the West to the East.

Dr. Hadwen brought up a subject which I think merits some attention, namely, the work of some of the Japanese. Until we have some method of diagnosis which is far more positive we will fail to recognize this disease in many instances. It is necessary to make an inoculation into the horse to diagnose this disease, so that it is necessary for us to know something about the etiology. There came to my attention a few weeks ago a recent article published in Japan on this subject. The article is published in Japanese. I made a great deal of effort to secure it in this country, and through the kindness of Dr. Noguchi he finally furnished me with a copy of the article in Japanese, also a translation. I wish to present to you some of the features of this article and to pass around plates, and if any of you can read Japanese, you have the original before you. As Dr. Hadwen has pointed out, this work needs verification before it can be accepted at its face value, but it does open up a field for investigation which should be followed by those men who are carrying on work on this disease.

(Dr. Fitch then read an abstract of the translated article above mentioned, which follows):

ABSTRACT OF THE JAPANESE ARTICLE "ON THE MICROORGANISM
CAUSING INFECTIOUS ANEMIA OF THE HORSE AND
ITS PURE CULTIVATION"

By YONEJI MIYAGAWA, TENJI TANIGUCHI, MASANORI NAGAO,
AND SAKAI TAKEMOTO

A short history of the disease is given and its distribution in the various countries. The authors state that "bacteria, parasites, and minute bodies resembling plasmodium have been described in the blood corpuscles." Miyari found minute intraendothelial bodies in the spleen of diseased horses, and Miyashima found something within the cells which resembled what may be called chlamydozoa, taking the red stain of Giemsa. None of these findings, however, has been confirmed. Carré and Vallée in 1904-6 made some progress by demonstrating that the virus exists in the blood, viscera, and urine and can be transmitted to the healthy horse through the skin or by feeding. They could not cultivate the organism but found that the virus passes through Berkefeld filter V or Chamberland F. and B. They called the disease typho-anémie infectieuse de cheval.

The principal pathological findings were:

Spleen—In acute infection markedly enlarged, two to four times the normal sometimes. Capsule shows numerous scattered hemorrhagic spots. Pulp dark reddish, often friable. Occasionally a spleen without marked swelling shows the same hemorrhagic condition. In case the disease is chronic or there is a late relapse, splenomegaly is wanting or very infrequent, but the density of the spleen is increased.

Lymph glands—In acute cases general swelling throughout the system, often edematous. In chronic cases these changes are less marked.

Bone marrow—Always shows marked change. The yellow marrow becomes dark brownish red or reddish black, particularly in the proximal end of long bones for example, the femur and upper arm bones. In slowly progressing cases large circumscribed hemorrhages may be found in fatty marrows, or the marrow may show structure, but in chronic cases there are a few bluish dark hemorrhagic spots.

Blood—In acute cases there are no macroscopic changes except that coagulation is slow. In chronic cases, however, changes are very marked. Marked edema subcutaneously and in the viscera, not infrequently a yellowish tint in the organs.

Liver—Hemorrhagic spots may be found in various tissues of internal organs, submucous and subserous. Marked hemorrhages and swelling in liver, varying according as the course is acute or chronic. Congestion, fatty degeneration, etc., and some ruptures of the liver have been reported by Carré and Vallée.

Kidneys—Almost always hemorrhagic nephritis. Hemorrhagic spots in the cortex. Cloudiness.

Heart—Subendocardial hemorrhage, dilatation, hypertrophy, and myocarditis never absent.

The authors as a result of their work have cultivated an organism which they believe to be a spirochaeta. They state, "Last year (July, 1917) Miyagawa and Takemoto examined different tissues or organs, including the lymph glands, liver and kidneys, by means of Levaditi's silver impregnation method, and found a spirochaeta which was reported as having a possible etiologic relation to this disease. One or two other investigators confirmed this finding. The microscopical findings, however, were not alone sufficient to support the view that the spiral bodies found by us in the lymph glands, liver and kidneys of different horses were spirochaetae." To determine this point it was thought advisable to adopt the cultivation method and isolate the spiral bodies in pure culture. The following experiments were undertaken for this purpose.

Blood was taken from 6 horses suffering from infectious anemia and introduced into the culture media of Noguchi, consisting of a piece of rabbit kidney and ascitic agar. In the case of 5 horses pure cultures of the spirochaeta were obtained, the culture in the other case having been contaminated. Some of the specimens from these horses gave pure cultures on several successive attempts at cultivation.

By inoculating the pure culture of the spirochaeta isolated into normal horses we were able to produce the infectious anemia, and pure cultures of the same organism were cultivated from those experimentally infected horses. Subcultures were carried on for 2, 3, 4, and 5 generations.

The blood was taken at the time of the first paroxysm or during the second or third paroxysms. It was collected from a puncture of the jugular vein in a receptacle containing sodium citrate solution. The citrated blood was then inoculated by means of a capillary pipette into the culture media. The best results have been obtained when the blood was mixed with the Noguchi solid media to which a certain amount of agar was added, but we have obtained positive results also when inoculations were made into fluid media containing ascitic fluid and rabbit kidney. Semi-gelatinized horse serum medium prepared according to the method of Shimane has been inoculated with the blood from two horses, and we were able to obtain the organism and to make subcultures. Substituting ascitic fluid with horse serum we obtained once or twice a culture, but subcultures from this source have never been successful.

RELATION BETWEEN COLLECTION OF BLOOD AND PAROXYSM

As shown in the accompanying chart, cultures could be obtained five days before the first paroxysm and could be carried to the second generation. With blood taken at the time of the third paroxysm a culture was obtained in one out of eight tubes. It

appears that the sooner the blood is taken after the paroxysm the greater the percentage of positive cultivations. After the second paroxysm we could cultivate a large number of spirochaetae, but in two horses cultivation became more difficult as they became sicker. We suspect this difficulty to be due to a greater number of immune bodies in the blood.

Six successive blood cultures were obtained in one horse and two in the three other horses. Positive results were obtained also with emulsions of spleen and liver from one of the horses. Positive culture was obtained in ten out of eleven horses. The organisms were sometimes very numerous, sometimes very few. A second generation culture was obtained on seven occasions, a third only once. In the case of some horses we succeeded in keeping the culture up until the fifth generation.

Some of the more important findings in the blood were as follows:

Anemia and nucleated red corpuscles—Blood counts were always made before inoculation, and only those horses showing normal counts were used. Anemia develops quickly after infection with the culture. The reduction in hemoglobin is accompanied by the appearance in the peripheral blood of nucleated red corpuscles. In the report of the committee it was claimed that during the early period there were no changes in the red corpuscles, but that the resistance of the corpuscles was reduced as the disease progresses. Many small red cells were found, many large erythrocytes and meta-chromatic corpuscles, but the presence of the nucleated red cells would not be demonstrated. On the other hand, Hempel says that he found nucleated cells in the peripheral blood.

The leucocytes showed little change.

Of thirteen horses which were inoculated with pure cultures or with material obtained from horses successfully inoculated with pure cultures, three died either during paroxysm or in the course of the infection, and two were killed in the moribund state. There are two more in which the course of the infection is not yet complete.

The authors did considerable work in regard to the viability of the virus. They found that "blood proven to be infective by injection into normal horses was put into sealed tube and kept in the incubator for 120 days at 37° C. It gave negative results when injected into two horses. Tested subsequently for their susceptibility by injection of a virulent culture, both horses died with typical symptoms. Citrated blood kept in the incubator for 120 days at 37° C. was therefore shown to have lost its virulence. On the other hand, when we inoculated a culture which had passed through the third generation in 130 days, it was found to induce infection. This is interesting as showing that the infectious blood 120 days old has lost virulence, while that transferred to culture medium and cultivated for three generations is still infectious 130 days after the time it was taken from the infected horse. The citrated blood 120 days old was found to be sterile."

RELATION BETWEEN CULTIVATED AND UNCULTIVATED VIRUS

By inoculating one set of horses with culture and another set with uncultivated virus and then inoculating the recovered horses with either virus or culture—those which had first received virus with culture and those which had received culture with virus—it was found that no reaction or a very slight one took place, regardless of whether the first inoculation had been with virus or culture. Eight horses were used for this experiment, four in each set. The results indicate that virus and culture are identical.

SPIROCHAETAL FINDINGS IN THE CIRCULATING BLOOD AND IN POST-MORTEM MATERIAL

The lymph glands, liver, kidneys and adrenals from ten horses which had died either with a natural infection or as a result of inoculation with blood or culture were examined for the spirochaetae. They were usually found in larger numbers in the lymph glands and kidneys, especially in the casts from the tubules of the latter. The finding in the tubules of the kidneys is not convincing however, since it is known that in human material of this there is often found something which looks like a spirochaeta, and the same might be true of the horse. The organism was found also in the parenchyma of the lymph glands and in the small blood vessels. In the liver the organisms seem to have been taken up by histocytes. The circulating blood of ten horses was examined and spirochaetae found in that of six. The results in two cases are incomplete, and in two negative. This part of the work will be repeated. Some of the horses in this experiment had been inoculated with culture. The method of examination was to take the blood from a peripheral vein and make smears. In two horses several examinations were made of the blood, with positive results each time. The presence of the organism apparently bore no relation to the paroxysm, as in relapsing fever of man.

The number of organisms found was always very small.

PFEIFFER REACTION

Blood serum from recovered and normal horses was tested for its spirochaetolytic properties upon an emulsion of pure culture. The mixture of serum and culture was injected into the peritoneal cavity and the fluid examined at stated intervals. Three convalescent horses showed a reaction even with the weakest immune serum, while no reaction was obtained with the serum of two normal horses tested. The number of experiments was not large enough, however, for conclusive results. The serum used in the tests was separated from blood (10 c.c.) kept in the ice box twenty-four hours, some being used undiluted and some diluted. It was mixed with an equal quantity of culture containing about 200 spirochaetae per field. Examination of the fluid was made at intervals of thirty minutes, one hour, and two hours after injection, under the

dark field or by silver impregnation. When mixed with immune serum the spirochaetae disappear completely, while they do not with normal horse serum. This kind of test was repeated with practically identical results in three horses.

MORPHOLOGY OF THE SPIROCHAETA

The spirochaeta in the blood stains deeply with Giemsa. By decolorizing to different degrees one sees some deeply stained granules in the body, corresponding with the beaded appearance of the organism when seen under the dark field. They can be seen by silver impregnation but not by ordinary Loeffler, methylene blue, carbol fuchsin, gentian violet, etc., except by the use of tannin as mordant.

APPEARANCE OF SPIROCHAETAE IN CULTURE MEDIA

The organisms grow about the place where the material is introduced into the medium, forming colonies which gradually spread toward the side of the tube. The center of the colony looks like a cloud and contains innumerable spirochaetes on examination. The ring formation of the haze resembles the growth of *pallida*. Growth gradually spreads continuous in all directions. Ten to twenty tubes of culture medium were usually used on each occasion. We have been able to demonstrate the spirochaetae in culture when we were unable to find any in the blood smears. Two or three out of ten tubes usually show growth. The tubes should be left alone for some time after inoculation—thirty days is not too long.

ARE THE MORPHOLOGICAL ELEMENTS JUST DESCRIBED SPIROCHAETAE?

It is important to decide whether the elements which we have described belong to the animal or the plant kingdom. The morphological characteristics, staining properties, and division, etc., seem to ally them to the spirochaetae. They are especially comparable to the spirochaetae of relapsing fever. The organism is a difficult one to grow, as shown by the numerous unsuccessful attempts of previous investigators to cultivate it on ordinary culture media, and can be grown only on such media as Noguchi's.

The organisms cannot be dissolved by 10 per cent saponin, but they seem to dissolve in 10 per cent sodium taurocholate. This finding corresponds with that of Noguchi in the case of *Spirochaeta icterohemorrhagiae*.

FILTERABILITY

Our finding in this connection corresponds with that of others, who showed that the virus of infectious anemia passes through Berkefeld V and Chamberland F and B filters. We have been able to produce the disease by means of filtrates, with typical autopsy findings. The spirochaetae have been cultivated from animals inoculated with the filtrate, and have been used to transmit the disease to normal horses.

DIFFERENTIATION BETWEEN THE SPIROCHAETA AND
SPIROCHAETA EQUI

As the differentiation is difficult, we shall call the present organism *Spirochaeta equi infectiosa* for the time being. Infectious anemia has been considered capable of transmission to horses, donkeys, pigs, goats, and sheep, the calf, rat, dog, and guinea pig being insusceptible. We were unsuccessful in the injection of eight small pigs, and we doubt whether this animal is susceptible.

DISCUSSION AND CONCLUSIONS

We have obtained pure cultures of a spirochaeta from five out of six horses suffering from infectious anemia by the use of Noguchi's culture media. Some of the horses gave repeated positive cultures. By inoculation of the pure culture into normal horses we reproduced infectious anemia in five horses, and recovered from the five horses spirochaetae which we cultivated to the fifth generation in some cases.

The disease was reproduced in normal animals by the use of the second generation of a pure culture, and transmissions were made to normal horses. The same was true of a third generation culture. We believe, therefore, that we have cultivated the virus of infectious anemia.

The pathological findings and the anatomical findings in the horses inoculated with pure cultures or the organism correspond with those occurring in spontaneously infected horses.

The infectivity of the blood from horses with infectious anemia disappears in 120 days when kept in the incubator at 37° C., but when transferred to the third generation during 130 days it continued viable.

Cross immunity tests showed that the virus obtained in culture is identical with that found in the blood of infected horses. Neither the virus or cultures confers complete immunity.

The spirochaetae were detected in the postmortem material and in the peripheral blood of horses infected with the organism.

Pfeiffer's reaction was positive.

The organisms cultivated has the features characteristic of spirochaetae.

Colonies of peculiar characteristics formed on Noguchi's media. This organism belongs to the group of spirochaetae.

The spirochaeta is filterable.

The organism is difficult to differentiate from *Spirochaeta equi*.

THE CHAIRMAN: The next one who is going to discuss this question is Dr. E. M. Ranck, of Agricultural College, Miss.

DR. RANCK: I feel in discussing this paper that the more we study it the less we know about this disease. I have felt that for a long while. In the South, unfortunately, I do not know of any experiments that have been made to determine the etiology. I am very glad that Dr. Fitch was able to give us this information. This dis-

ease is a very hard problem in the South, and has been so for a number of years. As has been stated by previous speakers, it has been misinterpreted a number of times. I noticed those pictures this morning and feel somehow that swamp fever is very prevalent in horses in the South. This anemia we have always considered in the South as being the result of a weak heart. We now find that very frequently in connection with those so-called cases of swamp fever. I am very glad that Dr. Fitch brought out the fact that the infection with this anemia is the same in other countries as it is here. So far as our practical experience is concerned, the temperature charts in ordinary cases that we find in the fields are very much like those experimental charts that Dr. Scott showed us.

We have noticed something in the South, that is, some of our practitioners who have been studying this disease from a practical standpoint a number of years. We import a great number of mules from the North. We find that those animals coming down here in passing through the so-called acclimation period very frequently come down with swamp fever. We find that conditions that will lower the vitality of the animal will aggregate the condition for swamp fever. An animal suffering from an acute attack of colic will sometimes develop a case of swamp fever; so we are led to believe, just as investigators in Japan have shown us, that these other conditions will lower the vitality in some way or induce the onset of the disease. I think from a practitioner's standpoint that this is a very important observation that some of our men have made in the field, and we must not forget that the practitioner has a very great part in this work, that the intelligent practitioner is, after all, a court of last resort for the veterinary profession and we must be mindful of every end of this game.

We have had to fight anthrax a great deal. Owing to the fact that all of these cases have had these local edemas, it has led some of our practitioners to diagnose swamp fever as anthrax. Of course the microscope will determine at once if this is true, but it has been misleading in our part of the country.

Here is another thing our practitioners have noticed: The mortality of animals suffering from swamp fever will not be over 60 per cent; yet you put those animals to work and lower their vitality by working and those cases will assume a mortality of as much as 100 per cent, which shows that the animal which has been worked during the course of this fever is very much more prone to die from disease than one that is resting.

As to treatment, our men in the South have had more success with arsenical treatment, and that, following up this diagnosis by the Japanese, seems to have some justification. I am glad to see that those of our men who are using this arsenical treatment in the South have been on the right tack, and their field experience has proved that their treatment is correct. I am in accord with Dr. Scott that there are only two things after all that we must watch, and those are the bite of the fly and the disease itself. I am glad that we are

arriving at some kind of conclusion on this disease so that we can intelligently fight it from a practical standpoint.

There is one other thing that I neglected to mention about the diagnosis of the disease—a peculiar kind of a pulse which I can only describe as a slippery pulse. I know it as I feel it, but I can not describe it. It is a characteristic pulse of this disease, and those of us who have had any experience with the disease can easily detect it. I think that is all I have to add.

THE CHAIRMAN: Dr. Schalk will not be able to be with us, therefore I will call on Dr. Eichhorn to add to the discussion of this paper.

However, I wish to make an announcement at this time in reference to a change in our program for next Thursday morning. The paper on the program to be read by Dr. W. H. Turner of New Hope, Pa., on "Additional Observations on Tuberculin Testing," also that of Dr. T. E. Munce of Harrisburg, Pa., on "Malignant Catarrhal Fever," will be read in this section on Thursday morning.

This subject of infectious anemia is one of great importance. It is one that spreads all over the country, not only in our country, but some of the countries abroad, and from the discussion this morning and the papers read and presented you all understand that it is one that is attracting a great deal of attention from laboratory workers and men engaged in research work. The point that was brought out by Dr. Fitch is one that interests me very deeply. I have contended for a great many years—I may be wrong—that practically all diseases that are due to filterable virus are caused by organisms of this class. That will be found out one day if we live long enough.

I am now going to open this meeting for a general discussion, and I hope, gentlemen, that you will take advantage and discuss this matter liberally, because I know it is one of a great deal of importance. It would appear that those that discussed the subject have not covered it so fully that some of you would not have some questions to ask or something of that kind. Dr. Eichhorn, you have been interested in this subject. We would like to hear from you.

DR. EICHHORN: With reference to the reported findings of the causative agent of swamp fever by the Japanese investigators, I was surprised at the easy way in which they demonstrated the presence of the spirochete in the blood. While associated with the Bureau of Animal Industry we conducted numerous examinations of samples of blood of horses affected with swamp fever, and we at all times failed to observe such spirochetes as described by the Japanese investigators. I may state that the samples obtained were from horses affected in almost every stage of the disease. I believe it behooves us to be cautious in accepting the discovery of the etiological factor in swamp fever until the findings have been confirmed. Repeatedly we have had reports of the discoveries of the causes of various infectious diseases, especially of the group caused by filterable viruses, and these findings have never been confirmed. I especially desire to mention foot-and-mouth disease and hog cholera, in which the

discovery of the causative agents has been repeatedly reported, but in every instance they have been unconfirmed or disproved.

With regard to the papers presented, I was particularly interested in the splendid pictures of the sections of the bones presented by Dr. Wright. They were highly instructive, especially from the point of view that they taught us not to rely to any great extent on the bone marrow in the diagnosis of swamp fever; and since the post-mortem findings in this disease are also very indefinite, the diagnosis of the disease provides a difficult problem.

DR. H. P. HOSKINS: Dr. Eichhorn's remarks have given me sufficient courage to make a few confessions along this line. I was drawn into a study of this particular disease in connection with some studies of other filterable viruses, and I will have to confess that I was never, at any time, able to find anything that looked like spirochetes. That work was done in co-operation with one of our best spirochetologists, Dr. F. W. Baeslack, and he was unable to find any spirochetes, although he looked diligently for them. Our attention was drawn to the possibility of spirochetes being connected with this disease through its similarity to certain other diseases. Attention was called to it as being similar to "trench fever," which is so much like it, in certain respects, in France. I believe it was generally thought, and certain observations would indicate, that "trench fever" did not necessarily follow the bite of an insect, but that infected insects (lice) might live upon the host, and the latter become infected by abrasions of the skin, caused by scratching, acting as portals of entry for the virus excreted by the lice, or liberated as the result of crushing the lice on the body.

Another confession that I have to make is our absolute failure to cultivate any organism, following the method described in the Japanese paper, using the Noguchi medium. I have planted hundreds of tubes of that medium, and have yet to find anything which really looked like a spirochete. The transmission of the disease by insects is very interesting and we should bear in mind the fact that although it might be possible that the disease can be transmitted in that way, yet it may not be the way the disease is spread under natural conditions.

I have in mind a case where this disease was found to be on a certain farm. This farm was one where the owner was in the habit of pasturing horses for a number of his neighbors, and very heavy losses appeared among the horses that were brought to this pasture. Some of them died while on this pasture, and in quite a number of cases where horses were taken home in the fall, taken to the respective farms where they belonged, they subsequently died on those farms, and in not a single case, in those barns where these horses had been stabled and died, did deaths take place among the other horses in those stables.

Just a word about the treatment of this disease. I do not believe we should treat it, and I doubt very, very seriously whether we are justified in treating these cases and keeping them around. I do not

think it wise to work such horses and keep them alive, as they may be dangerous as a source of infection where there are a great many stable flies. Even though we have cases of reported recoveries, in not one case has it been proved that the blood of such horses had lost its infectious properties. We get those horses that carry infection, and what would appear to be the case, they also carry a certain degree of immunity, and just as long as these two factors remain in a state of equilibrium, the horses live. I have an infected horse in our experimental stables in Detroit, at the present time, that has not shown a thermal reaction for over a year. He is just as fat and sleek as any horse could be. If we worked that horse, he would rapidly go to pieces. Hard work might be a ready means of bringing about a quick end. As far as absolute immunity is concerned, I do not believe that we have absolute immunity in this disease.

DR. DUNPHY: Along these lines, has it been possible to find this disease in the bovine?

DR. MARSTELLER: Our experiment station on several different occasions has tried to transmit this disease to bovines, but none of the animals revealed symptoms of swamp fever. In regard to insect transmission, we kept a horse with animals that were having acute reactions in a pasture for, I think, two years; it did not become infected, though biting flies were present, and later inoculation proved it susceptible to the disease. One animal in particular we tried to infect by means of ticks that had been inoculated by feeding on the blood from an infected horse, but this particular animal has not reacted. So our experience is rather against the theory of insect transmission.

DR. HADWEN: I think myself, and I am sure you will agree with me, that the experiments described by Dr. Scott were very interesting, and I am quite satisfied that *Stomoxys* can bring about the disease. And, as he explained, to start the disease in a new locality it requires the introduction of an infective carrier into that district. Another point very much in favor of his work is that the chief infective seasons occur at a time when *Stomoxys* is very prevalent, but I think it is possible that these insects are not the only means of infection. The feeding in these insects is often interrupted. It is quite possible with these insects in nature to transfer sufficient virus by that method into the horse.

I was also very pleased with Dr. Fitch and Dr. Eichhorn taking these ideas of the Japanese with a grain of salt. I was in London some years ago and met two gentlemen who had found a very great discovery for syphilis. We have heard nothing more of this in recent years, so we should accept the Japanese discovery with some caution.

DR. HUGHES: I would like to ask more particularly of those that are conversant, as to the danger from contamination of immunizing sera from horses having swamp fever. What proportion die from infection of this kind? Is it common?

DR. EICHHORN: I do not believe that there is the slightest possi-

bility that such things might occur. The methods of preparing antitoxins and immune serums from horses would practically eliminate the possibility of transmission of the swamp fever infections with antitoxin or immune serums. With regard to the control of the disease, I fully agree with Dr. Hoskins that animals affected with swamp fever are a constant source of danger to susceptible animals and the only way to control the disease is by slaughtering the infected animals.

In view of the difficulty of diagnosing the infection it appears to me that the development of a biological test for the diagnosis would be the only means by which chronic, obscure and latent cases of swamp fever might be diagnosed. The very interesting paper of Dr. Watson shows what a wonderful advantage such a biological test offers in the diagnosis of some of the infectious diseases. The biological test for the diagnosis of epizootic lymphangitis as described by Dr. Watson provides the only means by which latent cases of this disease might be diagnosed and its dissemination prevented. Dourine is another example. It is now realized that it would be impossible to control dourine without the possibility of diagnosing the latent cases by the complement-fixation test. If we, therefore, could develop a reliable biological test for the diagnosis of swamp fever the control of the disease could be readily accomplished.

DR. WATSON: Until we know what swamp fever is, it would be very hard to decide the treatment. The disease, so far as I know, has been very little studied from that point of view. We have looked for the etiological factor without success, so the disease is being doctored entirely on an empirical basis.

There is a point I wanted to mention, not in relation to the fly theory at all, but it may be considered in that connection, and it may be considered also in relation to geographical distribution. I did not get you quite right, Dr. Fitch. I do think it is somewhat of a sporadic disease, and that is shown by its distribution. The valley of the Somme in France is a notorious district for swamp fever. It does not occur in any other part of France. We have brought down from some of those districts some swamp fever, and I have had swamp-fever horses in contact with healthy horses, and during the time I never succeeded in getting a case of swamp fever.

We are working today 18 horses that have survived swamp fever for seven or eight years. Two and one-half years after the swamp fever prevailed in those horses their blood was still virulent. Those horses are still out with horses that we are working day by day, but there are, I believe, possibly one, or possibly two cases that we can not account for. These are possibly swamp fever, but it seems to be rare; but, as Dr. Eichhorn has said, if we try the same experiments on immunization we will get the same results. We also have a mule there that apparently had been immunized, and the animal has been working and apparently is well.

DR. H. P. HOSKINS: I wish to supplement the remarks of Dr.

Eichhorn, who answered the question of Dr. Hughes. I would recall to your memories what happened a few years ago in connection with hog cholera serum and foot and mouth disease virus. Some of you will remember that a certain batch of hog cholera serum was accidentally contaminated with foot and mouth disease virus, and the one-half of one per cent phenol used as a preservative for the serum apparently failed to destroy completely the foot and mouth disease virus with which it was contaminated, several outbreaks of foot and mouth disease occurring following the use of this serum in the field.

It is not a long jump to think of other possibilities which might occur, and which Dr. Hughes brought out in his question. With these facts in mind, and in order to test out the particular point raised by Dr. Hughes, I have undertaken some experiments to prove or disprove that point. Dr. Hughes knows that it is necessary to preserve all therapeutic sera with some antiseptic. In order to answer the very question raised by Dr. Hughes, namely, would the trikresol which is used as a preservative for serum be sufficient to destroy the virus of swamp fever which might accidentally be present in the blood of a serum-producing horse, granting that possibility, I took some swamp-fever virus in the form of serum, from an artificially afflicted horse, and preserved it with four-tenths of one per cent trikresol. To make a long story short, I can positively state that four-tenths of one per cent trikresol, the strength ordinarily employed to preserve commercial sera, will destroy the virus of swamp fever in a comparatively short length of time, in a period of time less than is necessary to prepare a lot of serum for the market.

DR. SCOTT: One or two points have been raised that deserve further explanation. First, the criticism by Dr. Fitch that the term swamp fever should not be used because the disease is found at high altitudes and in regions not at all characterized as swampy. In Wyoming our elevation varies from 4,000 to 12,000 feet above sea level, and our average annual precipitation is about 14 inches. Swamp fever has been definitely reported from 14 of the 21 counties of the State and is known to occur at elevations from 4,000 to 9,000 feet. One would expect the criticism to hold true here, but as a matter of fact wherever the disease has been prevalent we find wet, marshy or swampy ground forming a part of the immediate vicinity. These conditions are brought about in an otherwise very dry climate by the annual melting of snows, forming lakes and causing the overflow of rivers, which leaves pools, small lakes and other low places covered with water. Irrigation also probably contributes to the same effect.

Another matter is in regard to contamination. We have been working on the disease since 1911. Our station work horses, which are well fed and well taken care of, are taken into the lots with our experimental horses at least three or four times a year to remove manure or for other important reasons. Though exposed in this

way, we have never had any cases among these work horses. We have kept well horses with infected swamp-fever horses together in these lots as long as two years and we have not gotten infection by contamination, except perhaps in the doubtful case mentioned in my paper. It should be mentioned that there were comparatively few biting flies in these lots. I think it takes a considerable number of these flies to infect in most cases, and in so far as seasonal distribution of swamp fever is concerned, the abundance of *Stomoxys* closely coincides with this distribution. We had more cases in Wyoming in 1915 than in any other year of our experience; that year we had a very great number of *Stomoxys*. Incidentally it should be mentioned that this was a very wet season, well adapted to the breeding of certain flies.

THE CHAIRMAN: Gentlemen, it is getting quite late and I think it is time for us to adjourn. It has been very gratifying for me to note that you gentlemen stayed here for more than one hour after the time for luncheon. I thank you for the interest shown in this subject. The section stands adjourned until Thursday morning at 9:30 o'clock.

TUESDAY AFTERNOON

The meeting was called to order at 2:00 p. m., President V. A. Moore presiding.

THE PRESIDENT: The Secretary has some announcements to make before the opening of the afternoon session.

(The Secretary made announcements about the Wednesday evening meeting and read telegram from Lieut. Leibold and a letter from Mr. Bayard, an honorary member of the Association.)

REPORT OF EXECUTIVE BOARD

THE SECRETARY: The Executive Board wishes to report on some applicants that were laid over.

In Colorado, Dr. Charles Stewart, applicant from Colorado Springs, has been laid over for further information.

Dr. Wyant, an applicant from Indiana, has had his application rejected.

The application of Dr. E. H. Fletcher has been recommended for admission.

Dr. Aamoth, whose application was laid over, is still laid over.

Dr. Nash of Minnesota has had his application also laid over.

Dr. Lovell of Spaulding, Nebr., was laid over for further information.

The application of Dr. T. E. Jones of Ohio has been laid over for further information.

The applications of Dr. Fletcher, Dr. Hart and Dr. Knapstein, all of Wisconsin, which were laid over for further vouchers, have been properly vouched for and these gentlemen have been recommended for membership.

DR. W. H. HOSKINS: I move the several recommendations be approved.

(The motion was seconded and carried.)

THE SECRETARY: The following applications have been acted upon by the Executive Board:

Dr. S. D. Patterson of Wisconsin, whose application was laid on the table last year, has been recommended for admission.

The application of Major B. A. Seeley is recommended for admission.

The application of C. S. Elliott, Washington Court House, Ohio, is favorably recommended.

The application of John A. Wende, Buffalo, N. Y., was favorably recommended.

F. E. Helton, Tallulah, Ala., favorably recommended.

The application of Harry G. Wickes, favorably recommended.

Dr. S. M. Blackberg, favorably recommended.

Dr. A. A. Lenert, favorably recommended.

Dr. V. A. Scott, favorably recommended.

Dr. George R. Powell, Cleveland, favorably recommended.

John H. Copenhagen, favorably recommended.

Dr. McElroy Dean, Montgomery, favorably recommended.

Dr. Vinsel, Montana, favorably recommended.

Dr. Sid Galt, favorably recommended.

Dr. G. D. Grogan, favorably recommended.

Dr. H. W. Leib, Winchester, Ill., favorably recommended.

Wayne A. Hornaday, favorably recommended.

J. S. Nichols, favorably recommended.

James T. Traylor, Fort Worth, Texas, favorably recommended.

J. G. Kerr, Beaumont, Texas, favorably recommended.

John T. Barnett, Booneville, Miss., favorably recommended.

Dr. O. F. West, Shelton, Ill., favorably recommended.

Frank E. Kitchens, Greenville, S. C., favorably recommended.

Captain D. J. Holton, Camp Travis, Texas, favorably recommended.

The applications of Dr. C. O. Benson of New York City and Dr. William L. Douglass are recommended under the suspension of the rules. These two are 1919 graduates, and they have to be admitted under suspension of rules.

DR. WM. HERBERT LOWE: Mr. President, I move the adoption of the recommendation of the Executive Board.

(The motion was seconded and carried.)

THE SECRETARY: The Executive Board recommends that the Special Committee on Bovine Tuberculosis be continued.

DR. W. H. HOSKINS: I move that it be approved.

(The motion was seconded and carried.)

THE SECRETARY: It is recommended by the Executive Board that the proposed change in the Constitution and By-Laws referring to the organization of a special section for Bureau of Animal Industry employes be disapproved.

(It was moved, seconded and carried that the recommendation be approved.)

THE SECRETARY: The Executive Board recommends that the proposed amendment to Article V, section 4, relative to combining the office of Secretary and Editor of the JOURNAL, be laid on the table and that a committee of three be appointed by the President to investigate the subject and report upon the feasibility at the next meeting of the Association.

(It was moved, seconded and carried that the recommendation be approved.)

THE PRESIDENT: It is so ordered. The Chair will appoint the committee later.

That concludes the recommendations of the Executive Board. Is there any matter that any member wishes to take up before we proceed with the program?

DR. FITCH: I would like to move at this time that the suggestions contained in the President's address of yesterday—and I relate especially to the suggestion in regard to the appointment of a committee in regard to biologics and the National Research Council, I believe there are one or two others—be referred to the Executive Board.

(The motion was seconded and carried.)

ELECTION OF OFFICERS

THE PRESIDENT: If there is nothing to come before us at this time, the next item of business is the election of officers.

The first officer to be elected is President. Nominations for the office of President are now in order.

DR. WINCHESTER: I desire to put in nomination for the office of President Dr. C. A. Cary of Alabama.

DR. JOHN ADAMS: Gentlemen of the American Veterinary Medical Association—and this is the American Veterinary Medical Association as I understand it—not the Veterinary Medical Association of the University of Pennsylvania, or Cornell or any other institution or association of the South or of New England, but it is *the* Veterinary Medical Association, the *American* Veterinary Association, representing men from all sections and from all schools. Get that into your heads. Some men, I think, haven't gotten that into their heads yet. (Applause.) They seem to think this is an association for the personal gratification of ambition of sections of the country or schools or factions. The hope of the veterinary medical profession lies in the deliberation and the action and the work of this particular institution.

Just at the present time we are in a critical condition. We are just about to launch a movement that will in years—and less than a generation I predict—place American veterinary medicine on a plane with human medicine and the other sciences. We are far behind the medical science in Germany. It ought not to be and it won't be, but if we are not careful, gentlemen, our progress is going to be slow.

In this United States, represented in this Veterinary Medical

Association, there is splendid timber for the officers of this society, scattered broadcast. When we choose a leader, the most forceful leader in our profession, we must look carefully that we are getting the best material. We want a man with a broad view. We want a man who knows the veterinary profession, a man with vision, a man who has the courage to carry out his convictions, and with friends, to work toward that objective.

Gentlemen, I have in mind such a man. He is not the only man. For twenty-seven years he has labored in the verdant, promising South. He knows the veterinary profession of the past. He knows the pitfalls that are to be avoided in the future. I, with pleasure, second the nomination of C. A. Cary. (Applause.)

(Dr. Burson moved, and it was seconded, that the nominations be closed.)

DR. BUTLER: Mr. President, I want to take the liberty of asking that the motion to close the nominations be withdrawn. Surely this Association does not want to close the nominations against any man. I ask it because I believe that is the spirit of the Association.

(The motion was withdrawn.)

DR. BENNETT: Mr. Chairman, I have listened with considerable interest to what our different brothers have had to say, particularly what Dr. Adams has had to say. This is not an Association of one man or any particular body of men. We don't represent one particular institution. We represent several, and when a man comes into this Association he should be broad enough to not stick to his own, but look to the betterment of the veterinary profession in general.

Dr. Adams made the statement that some of us seem to have forgotten that this is not an association for personal gratification. The Doctor knows; I don't. At the same time we are all veterinarians here together and we are looking for the betterment of our profession, the elevation of our profession.

We all heard what Dr. Mohler had to say yesterday, where we were placed. That wasn't to our credit. Now, this Association has placed itself on record as trying to elevate the veterinary profession. We are all interested in that. We are all interested, every one of us, no matter whether we came from Pennsylvania, Cornell, Chicago, or any other institution. I know veterinarians in this country who come from schools that are not recognized, but they realize that the veterinary profession must be recognized.

I have in mind a man who would fill this position better than any other man, and I therefore take great pleasure in submitting the name of Dr. Kinsley. (Applause.)

DR. BUTLER: Gentlemen, I can not let this opportunity go by, although I have no desire to weary you, or to make any long nominating speech; but I want to second the nomination of Dr. Cary for the simple reason that I feel that those who don't know him are apt to think less of him than those who know him intimately as I do. I have known him for thirty-eight years. During all those

years the veterinary profession has had a staunch, straight, honest, loyal, enthusiastic supporter, a man who looks to the best interests of the profession, regardless of how it hurts himself or others. No profession has ever had a more loyal, a more true advocate and representative.

Further than that, like Dalrymple and Francis, he is a pioneer in the best work that has been done for the development of the live-stock industry of the South, and we of the veterinary profession today are in touch with a better knowledge and a better appreciation of the live-stock business, judging, feeding, etc., and every phase of it. Dr. Cary has been a shining light in what developments have occurred in the live-stock industry of the South. He has the respect, he has the confidence, of the live-stock men of the South, and if you elect him President of this organization today it will be the best proof that the veterinary profession has ever had because he is known over a third of the United States.

I want to say further that I know of no better veterinarian, with a broader vision, a broader or more accurate knowledge of the whole science of veterinary medicine. As a practitioner he has no equal, and he keeps abreast of the progress.

Further than that, Dr. Cary will hew to the line. He will have no favorites. There will be no cliques or factions that will have any standing with him if he is elected, because—and I have known him thirty-eight years—when it comes down to action, he hews to the line.

I want to say to you in conclusion, we don't ask you to elect Dr. Cary as a southern veterinarian; we ask you to elect him as an outstanding American veterinarian. (Applause.)

I am not going to detain you longer. I just want you to pardon one personal word. I found myself when I came to this convention in one of the most embarrassing positions I have ever been in. I knew Dr. Kinsley before he ever studied veterinary medicine. There is no better, no broader, no finer, veterinarian living in America today; and I want to say to you that I have had nothing in all my dealings with Dr. Kinsley that would make me vote against him. I am not going to vote against him—I can't do that—but I am going to vote for Dr. Cary. (Applause.)

DR. W. H. HOSKINS: Mr. Chairman, I want to add another second to the nomination of Dr. Cary. I have been associated with Dr. Cary for more than a quarter of a century. There have been many times that we have differed in points of view, and many times when we have been antagonistic to each other and fought for our special hopes and aims in this Association; but I want to bear testimony that during that entire twenty-five years he has maintained the highest ideals of the Association and the veterinary profession of any man in this Association's history. I bear that testimony from close association with him. (Applause.)

DR. R. C. MOORE: I want to say in regard to just what has been said that I certainly corroborate everything that the last two speak-

ers have said. I am placed in the same position that Dr. Butler is in. I have known Dr. Kinsley since before he was a veterinarian. He was a student in the institution which I represented. He was my co-worker in that college for years. However, I do hold Dr. Cary as a representative of this Association above everybody else put up here today. I believe we owe it to him. I hoped we could come south and elect Dr. Cary by acclamation. Therefore, I second the nomination of Dr. Cary. (Applause.)

(It was moved and seconded that the nominations be closed. Carried.)

THE PRESIDENT: We are to elect by ballot. I think that is the method that has been followed in the past. I will ask Dr. Cotton and Dr. Flower if they will please act as guards of the ballot box, so to speak, and the members will pass around. I will appoint for tellers Dr. Gow, Dr. J. G. Wills and Dr. Hershheim.

(The votes for President were cast.)

THE PRESIDENT: Have all voted who care to? I declare the ballot for President closed.

I think that it has been customary to continue the election of the Vice-President while the tellers are counting the ballots for President. If there is no objection we will proceed in that way at this time. Hearing none, I will ask Drs. Ranck, Preston Hoskins and L. H. Howard to act as tellers for Vice-President. Nominations for Vice-President are now in order.

DR. FITCH: In appreciation of the efforts of veterinarians during the past war, I think it would be fitting for a recognition that one of the army veterinarians be elected as Vice-President. I have in mind such a man who has been a member of the Association for a number of years, who is an enthusiastic and a faithful worker, and who will, I am sure, continue his interest whether he is elected or not, but I believe will be more efficient as your Vice-President, and that man is John H. Gould, who is now in the War College at Washington. He has done faithful service and will be a credit and an efficient and earnest worker for the Association.

DR. GLENNAN: I would like to place in nomination the name of Adolph Eichhorn of New York City.

DR. W. H. HOSKINS: I would like to second the nomination of John H. Gould. He is one of the faithful men. He has been for a good many years.

DR. WM. HERBERT LOWE: Mr. President, I would like to have the privilege of seconding the nomination of Adolph Eichhorn.

DR. BENNETT: I would like to present the name of Dr. Sigler of Indiana.

DR. MACKELLAR: I would like to place in nomination the name of Happy Tom Smith of Jersey City. (Seconded.)

DR. EICHHORN: I would like to place in nomination the name of W. E. Jackson.

DR. COTTON: I would like to submit the name of Fred H. Schneider of Philadelphia.

DR. BUTLER: I wish to place the name of Pegram Flower.

DR. TURNER: I would like to nominate Dr. Cooley.

DR. REYNOLDS: Our section of the Northwest doesn't seem to be represented. I should like to place in nomination the name of Dr. W. H. Crewe of North Dakota.

DR. BLAIR: I would like to place in nomination the name of Dr. W. W. Yard of Denver.

DR. SIMMS: I would like to nominate Dr. Northrup.

DR. DALRYMPLE: I nominate C. E. McGilvray.

DR. W. H. HOSKINS: I feel that we are crowding these nominations into a pretty narrow territory. It seems to me we are overlooking Canada, and the wonderful support these splendid men have given us. I would like to place the name of E. A. Watson as nominee from Canada.

DR. EICHHORN: I place in nomination Dr. Hilton from Canada.

DR. MAYO: He is a member of the Executive Board.

(It was moved and seconded that the nominations be closed. Motion carried.)

(Dr. Northrup withdrew his name in favor of Dr. Sigler of Indiana.)

THE PRESIDENT: We are to elect five Vice-Presidents. It has been the practice that the five names receiving the highest number of votes shall be declared elected. Is that the pleasure of this gathering? Each member is to vote for five Vice-Presidents. If there is no objection, the practice that has been followed in the past will be observed, and the five names receiving the highest number of votes will be those of the men elected Vice-President. Hearing no objection, it is so ordered. If the tellers will prepare the ballots and ballot boxes, and the judges will take their respective places, we will proceed to vote.

(The ballots were cast.)

THE PRESIDENT: Have all members voted for Vice-President, or all who care to vote? If that is the case, I declare the polls closed for Vice-President. The tellers will proceed to count the votes and report.

The tellers for the vote for President are ready to report.

DR. WILLS: Total number of votes cast, 306. Dr. Cary, 219; Dr. Kinsley, 87. (Applause.)

(Three cheers were given for Dr. Cary.)

DR. KINSLEY: I move you the election be made unanimous. (Applause.)

(The motion was seconded and carried.)

THE PRESIDENT: The next officer to be elected is Secretary. I will ask Dr. Musselman, Dr. Blattenberg and Dr. Douglass to act as tellers at the election of Secretary. Nominations for secretary are now in order.

DR. STANGE: In many respects, it seems to me that the office of Secretary is one of the most important offices in this Association. I believe that the business management of the Association is a very

vital factor, and when we have a man who is handling these affairs in a thoroughly satisfactory manner we ought not to consider a change. I wish to place in nomination, therefore, the present Secretary, Dr. N. S. Mayo. (Applause.)

DR. COOLEY: Mr. Chairman, I wish to second that nomination.

DR. R. C. MOORE: Two years ago we met in Kansas City. We had a splendid meeting, a splendid year. I believe we had one of the most efficient secretaries that I have ever seen in the office of Secretary of this Association. He was elected, I think, by acclamation, at least an overwhelming majority. Soon after his election he responded to the call to his colors, and left the office in the hands of a competent man. Last year, owing to his absence, a change was made. I believe we owe it to that secretary that he be put back where he was when he went to France. Therefore I nominate Col. L. A. Merillat.

COLONEL MERILLAT: Mr. Chairman, I couldn't, of course, be insensible to such a recommendation, and do not want to put myself in a position of being too weak to run against opposition for this office, nor do I want to be placed in a position of one who is not willing to do his duty for the veterinary profession. However, for strictly personal reasons, gentlemen, I am unable to serve in this office, and would recommend that those of you who have me in mind would vote for one of the other worthy candidates. I thank you very, very kindly, Dr. Moore, for the great support you gave me while I was Secretary. I would prefer to retire from the veterinary profession for strictly personal reasons at this time.

DR. MCAUSLIN: I would like to ask Dr. Merillat a question. Would the position of Secretary seriously embarrass you, if it were attended to?

DR. MERILLAT: I milk fourteen Holstein cows day and night. I am afraid it would. (Laughter.)

DR. DALRYMPLE: I hate to put anybody against Dr. Mayo, but I would like to submit the nomination of E. I. Smith, whom I have known for some time and been associated with. I know his capacity for work and organization and systematic work, and just as a matter of variety I nominate E. I. Smith.

DR. ADAMS: Just a moment. The office of Secretary is one that requires not only special ability but considerable training. The present occupant has the ability and he has had the training. Furthermore, he is not only a very efficient Secretary, but he is a most able and courteous gentleman. I second the nomination of Dr. Mayo. (Applause.)

(It was moved by Dr. Blattenberg, and seconded, that the nominations be closed. The motion was carried.)

(The votes were cast for Secretary.)

THE PRESIDENT: The next office to be filled is that of Treasurer. I will ask Dr. Pyatt, Dr. Burson and Dr. Campbell to act as tellers.

DR. BUTLER: I wish to place M. Jacob's name in nomination. He is the present Treasurer, a man who has handled the funds

successfully, a veterinarian from the State of Tennessee, a capable gentleman well-respected by the live-stock industry of Tennessee. (Applause.)

(The nomination was seconded.)

(It was moved by Dr. Hoskins, seconded and carried, that the nominations be closed.)

(It was further moved by Dr. Hoskins, seconded and carried, that the Secretary be instructed to cast one vote for Dr. Jacob as Treasurer of the Association.)

THE PRESIDENT: I think that concludes the election of officers. I believe it has been customary at this time to receive invitations for the place of the next meeting. I will entertain any motion to that effect at this time.

DR. MAYO: You understand that the place of meeting is fixed by the Executive Board.

THE PRESIDENT: I should have added, before I finished, that the place of meeting is decided by the Executive Board, but for many years in the past it has been customary at this time in the program to have invitations extended to the Association so that the Executive Board perhaps may know the wishes of the Association and the places to which they wish us to come another year. Consequently, I will entertain at this time any remarks on this subject.

DR. W. H. HOSKINS: Is it not possible for the Association to vote in open meeting as to places? I think we can vote for the places, and the Executive Board then decides it.

DR. MAYO: You will find that our By-Laws say: "Unless otherwise provided for, the Executive Board shall select the time, duration and place for holding the annual meeting and shall make the necessary arrangements therefor."

DR. MERILLAT: I desire, Mr. President and colleagues, to say just a word in behalf of the State of Ohio for the next meeting. The city I prefer, of course, is Columbus, which has one of the great and growing veterinary institutions in the United States. You will remember that it is now sixteen years since the great State of Ohio has had a meeting of this Association, and since its veterinarians are so receptive and are working so energetically to entertain this body, I would move you, Mr. President, that the city of Columbus, Ohio, be selected as the next place of meeting. (Applause.)

MR. R. C. MOORE: Mr. Chairman, I want to second that motion that we go to Columbus, Ohio, for our next meeting.

MR. JOHN Y. BASSELL (Manager Columbus Conventions and Publicity Association, Columbus, Ohio): I am here representing the capital city of the great State of Ohio. I come bearing messages to you. I am instructed by those who send me to convey to you their greetings and their good wishes, and to express to you the pleasure that they would have in receiving you as their guest in convention in 1920.

They have told me further to say to you that they are inviting you to a city recognized throughout this country as a great conven-

tion city. About one convention a day is entertained in Columbus for every day in the year—National and State. The city of Columbus has grown proficient in entertaining conventions by virtue of the great number it entertains. It knows how to entertain conventions, and it has entertained the largest that has met in this country or the world, notably, the great Centenary convention, and the last meeting of the Grand Encampment of the G. A. R., with possibly the greatest attendance of any in its history.

They have told me to say to you—and if you look at the map you will find that it is true—that Columbus stands practically in the center of population of this great country of ours. It stands absolutely in the center of the great Empire State of Ohio. It has 27 railroads—steam and electric—that converge there. It has north roads, south roads, east roads and west roads, and connects practically with every trunk line in America. You know, my friends, that you are seeking the lines of least resistance just as actually as if you would say that a straight line is the shortest distance between two points, when you seek a central point for your convention. Within a radius of 500 miles over two-thirds of all the people who live in this country are to be found. Within the same radius absolutely more than four-fifths of the members of your Association reside. It is a safe proposition that you will have a larger attendance in the city of Columbus than in some city less favorably situated.

We have hotels galore. There are 45 hotels of various kinds in Columbus, and you can get entertainment of the ordinary, cheap kind, if that is thought to adjust itself to the purses of any of you, or you can get the best entertainment that can be found in hotels in any place in the world.

You can have an auditorium there for your use, and I will give you a pointer right here. You can have the same facilities in three of our hotels as you have here, if you choose to have it, but our organization will pledge to you the use of our great Memorial Hall that was constructed with an eye to serving perfectly the needs of a convention. That auditorium can be made to supply your wants perfectly as a place of exploitation for your people who make exhibits, and also take care there of your membership, and you, my dear sirs, because we charge you nothing for the use of that auditorium, can sell your space to your exhibitors, and put that money in your purse for your organization funds. (Applause.)

As far as our hotels are concerned, our organization has a contract with them whereby they obligate themselves, under forfeit, not to increase their prices to delegates attending conventions, and you can go with the absolute assurance that you will pay no more to the hotels than is being paid by the commercial tribe. (Applause.)

Street-car fare in our town is eight tickets for a quarter. They haven't been able to get any more, and darned if I believe they will. (Applause.)

I will go further and say that you can get more for your money

in the hotel way in the city of Columbus than in any city of like population in the United States. I run all over the United States. Just as I am now in New Orleans, I may be in another city tomorrow or next day. I know what I am talking about. I will guarantee you can get more for your money in Columbus than in any city in the United States.

Now, then, boys, we want you. Columbus is noted for her splendid courtesy and hospitality to the visitor within her gates, and I am instructed to say to you that if you come to Columbus, after you have enjoyed to the fullest the delights of Columbus, you will go away satisfied. We are not too dry—we are just dry enough. (Applause.)

After you have enjoyed all the delights and pleasures that Columbus has within her power and will cheerfully extend to you, if you can find it in your hearts to change your abiding place, and not make Columbus your permanent home, then it will be with us farewell. Our people would offer an invitation for this Association to come to Columbus.

May all your days be spent in bliss,
 May all your plans succeed;
 Be half as happy as we wish,
 And we'll be blessed indeed.

May happiness your brows entwine,
 May peace your pillows strew;
 May every joy of life be thine,
 Is Columbus' prayer for you. (Applause.)

DR. W. H. HOSKINS: Mr. Chairman, there is nothing left to be said. I move that we go to Columbus.

(The motion was seconded.)

DR. MAYO: Mr. President, before a vote is taken on this, I think it is no more than courtesy to other cities who have presented invitations that they should be read. I want to do my duty in the matter. This Association has received invitations from the Chamber of Commerce of San Francisco, from New York City, Boston, and from the city of Springfield to hold the next convention in those cities. These are formal invitations from boards such as the gentleman represents, and I presume would be able to send orators to invite us also.

THE PRESIDENT: I think that concludes the invitations, and I feel that we should have had these other invitations, because we don't want to be without a future place of meeting. You have heard the motion. It has been moved and seconded that this Association meet in Columbus, Ohio, next year. Is there any further discussion?

(The motion was carried. Applause.)

MR. BASSELL: I thank you, gentlemen. (Applause.)

THE PRESIDENT: While we are waiting for the tellers I think we should proceed to clean up business matters that were unfinished

yesterday by way of committee reports. We have a strenuous program ahead of us, and it is very important that we do not delay these reports longer than necessary. I am going to ask if Dr. Dunphy is ready to submit his report on Intelligence and Education.

DR. DUNPHY: Owing to the fact that only one member of the committee besides myself is present, and we were late getting in the report from the other members of the committee that have made some inspection of colleges, it has been impossible for Dr. Kiernan and myself to get together and have this report arranged, but I think we can promise you the report tomorrow. We are going to have a meeting this afternoon.

THE PRESIDENT: This report will be laid over until tomorrow. Next we will have the report of the Audit Committee, Dr. Ryder.

(Dr. Ryder read the report.)

DR. KINSLEY: I move, Mr. President, that the report be received and placed on file.

(The motion was seconded and carried.)

(The Committee on Necrology and the Committee on History were not ready to report.)

THE PRESIDENT: The tellers on election of Secretary are ready to report.

(The results of the vote were as follows: Dr. Mayo, 170; Dr. Smith, 100.)

THE PRESIDENT: All the committees have reported except those laid over until later. Has anyone any new business to come before the Association? If not, the Chair will declare a recess until the rest of the votes are in and the tellers are ready to report.

(Recess.)

THE PRESIDENT: The tellers are ready to report.

(The vote for Vice-Presidents resulted in the election of the following: Dr. J. N. Gould, First Vice-President; Dr. E. A. Watson, Second Vice-President; Dr. E. P. Flower, Third Vice-President; Dr. A. Eichhorn, Fourth Vice-President; Dr. A. S. Cooley, Fifth Vice-President.)

THE PRESIDENT: Is there any further business to come before the Association at this time? I would like to call attention to the important papers that are to come tomorrow, and I hope we will all be there.

Adjournment.

(Proceedings to be continued.)

OTHER ASSOCIATIONS

VIRGINIA VETERINARY MEDICAL ASSOCIATION

Promptly at 10 A. M. on January 9th, Vice-President Owen called the Virginia Veterinary Medical Association to order in the small assembly hall of Murphy's Hotel, Richmond. He ordered the reading of the minutes, which were adopted without correction. The roll was then called, and twenty-seven members answered present.

Vice-President Owen then stated that in the absence of both the president and the first vice-president, he would proceed with the business of the association, and call for the election of officers, which resulted as follows:

President, Major R. A. Dunn; First Vice-President, Dr. T. M. Owen; Second vice-president, J. F. Kagey; Secretary-treasurer, Dr. W. G. Chrisman.

The newly elected president then took the chair and gave some very interesting remarks, pledging himself to serve the association to the best of his ability.

The next item of business was to select ten members whose names would be presented to the Governor from which he will select five to compose the state board of examiners.

The following names were selected: Dr. S. C. Neff, W. T. Gilchrist, Thos. Fraser, H. S. Willis, H. Bannister, W. G. Chrisman, H. H. Adair, H. T. Farmer, E. A. Robinson, and R. E. Ferneyhough.

The report of the board of censors, recommending the following gentlemen to membership, Dr. C. L. Phillips, Hampton; Dr. J. S. Nichols, Blacksburg; Dr. A. T. Malcom, Occoquan; Dr. P. J. Lardis, Weyer's Cave, and Dr. C. A. Cassilear, Leesburg, was received and adopted.

This completing the business of the hour, the President called for the first number of the program, an address by Dr. E. G. Williams, on the subject, "The Human Animals." His remarks were both interesting and instructive. We were glad to hear the State Health Board representative, and hope he will always be seen with us in our deliberations.

Dr. A. Eichorn then gave an excellent address on hog cholera, with special reference to differential diagnosis. The association was especially fortunate in having Dr. Eichorn. The press for time prevented discussing this subject, which was greatly regretted.

Dr. J. P. Turner followed with a talk on "Abortion Disease in

Dairy Cows." Dr. Turner brought out some interesting points which we would have liked to discuss, but time would not permit.

Professor R. E. Hunt of the Animal Husbandry Department of Virginia Polytechnic Institute gave a most interesting and instructive address on "Feeds and What We May Expect From Them." This address supplied a long felt need on our program.

A very good paper, full of interest, was presented by Dr. L. D. Whitaker on the subject of Cacodylate in Practice. Dr. Whitaker's results from the use of this drug have been quite satisfactory.

Dr. H. H. Rowe then entertained us with a very interesting account of his trip to France. At this juncture the announcement came that the guests were assembling in the Banquet Hall. Adjournment was orderly but rapid.

The toastmaster, Dr. Ferneyhough, who is an artist, simply spread himself. Never was there a better or more delicious dinner served at Murphy's Hotel. The guests were the first men of the state and the ladies were the queens of the "Ladies' Auxiliary" of the association. Governor Davis and his secretary, Col. Leroy Hodges, Attorney General Saunders, Senator Garrett, Chairman of the Finance Committee, Col. Brever, Chairman of the House Finance Commission, Hon. Roswell Page, Second Auditor, Dr. Julian A. Burruss, President of V. P. I., and Hon. G. W. Koiner, Commissioner of Agriculture, were some of the most noted guests.

Meeting adjourned to meet again at Ocean View, on July 8 and 9, 1920.

W. G. CHRISMAN, *Secretary-Treasurer.*

IOWA VETERINARY MEDICAL ASSOCIATION

THE thirty-second annual meeting of the Iowa Veterinary Association was held at the Hotel Savery, Des Moines, Iowa, January 13, 14, 15, 1920. A full three days' program was provided into which an effort had been made to incorporate papers and discussions of particular interest and value to veterinary practitioners, and which were presented from the practitioner's viewpoint. The interest of the Iowa veterinarians in the meeting may best be shown by the attendance, approximately 350 veterinarians being present. Sixty-two applications for membership were favorably acted upon at the business session, which gives the Iowa Association a total active membership of 448, which with 24 honorary members and 12 associate members makes a total membership of 484. Marked

interest was shown in all sessions of the program. The papers were interesting and the discussions lively.

On Tuesday forenoon following the address of President G. A. Scott of Waterloo, Drs. N. L. Nelson of Ames and G. G. Miller of Council Bluffs, majors in the Army Veterinary Corps during the war, discussed various phases of the Army Veterinary Service. Dr. Nelson by the use of charts discussed "The Army Veterinary Corps in the Field." Dr. Miller discussed "Sanitary Problems as Related to the Army Veterinary Corps." Lieutenant Colonel Vans Agnew, division veterinarian at Camp Dodge, was present and made a strong plea for the support of civilian veterinarians in connection with the reorganization of the Army Veterinary Service. Definite steps in this regard were taken later in the meeting.

On Tuesday afternoon, Dr. H. E. Bemis of the Committee on Surgery presented a paper, "A Review of the Status of Veterinary Surgery," followed by a paper by Dr. K. W. Schalk of Iowa Falls on "Treatment of Abdominal Wounds with Prolapse of Internal Organs." Dr. George A. Scott of Waterloo presented a paper, "Sterility—A Sequel to Contagious Abortion," which caused much discussion of all phases of the abortion disease problem and which was much appreciated. Dr. D. M. Campbell of Chicago discussed "Advantages of Minding Your Own Business," in which various angles of the business end of veterinary practice were discussed and many important phases of the question brought out. Dr. F. M. Maxfield of Tama presented a paper on "Obstetrical Practice in Swine" which showed a thorough knowledge of the subject based upon wide experience. The paper was a valuable one and was much discussed. "Treatments for Laminitis," by Drs. M. W. Rosen-gren of Ackley and Hal Simpson of Denison, brought out considerable general discussion on therapeutics.

Wednesday forenoon was devoted almost entirely to a business session, including the report of the Committee on Legislation, by the Chairman, Dr. C. H. Stange of Ames, which showed that this committee had been actively working during the year for the best interests of the profession and ultimately for the live stock industry. The Secretary-Treasurer's report showed the Association to be in excellent financial condition. A number of important matters pertaining to the welfare of the Association and the veterinary profession as a whole were taken up during the business session and definite steps taken regarding them by the appointment of responsible committees. The following officers were elected for the new year:

President, S. K. Hazlett; First vice-president, John Patterson; Second vice-president, J. E. Robertson; Secretary-treasurer, H. D. Bergman; Member of Executive Board, F. H. P. Edwards, Iowa City. Following the business session the day was devoted to papers and discussions, as follows:

"Bronchopneumonia Contagiosa Suum, Caused by a Filterable Virus, Transmissible to Laboratory Animals" (illustrated), by Dr. F. Proescher of Sioux City. This paper was much discussed, particularly by the men present directly interested in research problems. Dr. R. L. Mundheuk of Chicago presented a paper on "Preventive Veterinary Medicine," which was favorably received.

The Committee on Diseases and Treatment presented the following interesting papers:

"Some Common Diseases as Treated by a Common Practitioner," Dr. H. B. Treman, Rockwell City.

"Survey and Summary of Poultry Diseases in Iowa," L. E. Willey, Ames.

"History of Rabies Outbreak at Dow City, Iowa," J. A. Brill, Dow City.

"Observations on the Intrapalpebral Test for Glanders," W. F. Guard, Ames.

"Diseases of Sheep from the Practitioner's Standpoint," H. W. Conner, Bloomfield.

Thursday's program, following considerable discussion on "Treatments for Worms in Swine," opened by Dr. W. L. Hanson of Greene, was devoted almost entirely to discussions on farm sanitation, hemorrhagic septicemia and tuberculosis. In fact the interest in these subjects was so manifest that their discussion was prolonged by common consent and several papers on general subjects scheduled for the afternoon were read by title. Drs. G. W. Blanche of Des Moines and K. W. Stouder of Ames discussed farm sanitation, particularly in connection with building construction. Dr. R. D. Wall, State Veterinarian, presented a paper on "Tuberculosis Eradication," followed by a paper by Dr. A. Eichhorn of New York on "Sanitary and Hygienic Measures in Control of Tuberculosis." Dr. C. H. Covault of Ames, by the use of a series of charts taken from actual tests, discussed "Interpretation of Tuberculin Tests," with particular emphasis on unusual reactions. Dr. Covault's talk was an interesting and valuable one and retained the attention of the assembly for a full hour.

No evening sessions were scheduled during the meeting, the

evenings being left open for class and group reunions, committee meetings, theatre parties and recreation in general. This fact was apparently appreciated by those in attendance and resulted in almost perfect attendance throughout the day sessions. The Association adjourned after voting the 32d annual meeting the best ever, and with the firm conviction to "repeat" next year.

H. D. BERGMAN, *Secretary*.

OHIO STATE VETERINARY MEDICAL ASSOCIATION

THE regular annual meeting of the Ohio State Veterinary Medical Association was held on January 15 and 16, 1920, at the Deshler Hotel, Columbus, Ohio. Although the weather was very inclement, the attendance was very large and with the attention given and the lively discussion of the subjects presented, argued well for the enthusiasm of its members.

The meeting was presided over by Dr. W. B. Washburn, who in a very appropriate manner delivered a most inspiring address.

The report of the Secretary was complete in every detail. The financial statement, in particular, showed the Association to be in a flourishing condition.

Dr. David S. White, Dean of the Veterinary Department of the Ohio State University, gave the report of the Committee on Progress and Education. In this report he touched upon the various matters pertaining to the future welfare of the profession, and it clearly showed the possibilities in store for us.

The report of the Committee on Diseases, Dr. J. N. Shoemaker, chairman, threw some light upon the complexity of the differential diagnosis of swine diseases; and in connection with the paper of Doctor Dimmock of the University of Kentucky, which was read immediately after the close of the business session, was of great interest to the practitioner engaged in practice of veterinary medicine in a community where swine raising is the chief industry.

The Dinner Session of the meeting, which was held in the spacious ball room of the Deshler, was a great success. One hundred and seventy members and visitors were present at this function. The toastmaster was W. B. Washburn, while Drs. David S. White, Harry T. Moss, T. A. Burnett, J. F. De Vine, W. W. Dimmock, C. A. Cary, N. S. Mayo and Professor Erf were the speakers of the evening.

Dr. Cary emphatically impressed the importance of an intimate relationship and full co-operation between all veterinary organiza-

tions of the various States and the A. V. M. A. in all matters pertaining to the elevation of the standard of veterinary education and of the profession in general.

The time of the closing session of the convention was taken up entirely by the subjects presented, "Breeding Problems in the Dairy Herd," by Dr. J. F. De Vine; "Bacterial Therapy in Genital Infections in Cattle," by Dr. F. B. Hadley, and "Tuberculosis in Live Stock, Detection, Control and Eradication," by J. A. Kiernan. The discussion of these most important subjects was led by Doctors Reuben Hilty, Theo. A. Burnett and C. E. Eddy.



Where the Fifty-Seventh Annual Meeting of the A. V. M. A. will be held Aug. 23-27, 1920. Seating capacity eight thousand.

The nomination and election of officers for the ensuing year was a matter of particular importance, due to the fact that it will be entirely up to the Association to perfect entertainment plans for the 1920 meeting of the A. V. M. A., in Columbus next August. Judging from the names of the various candidates elected they evidently were selected with due consideration as to their adaptability for office.

President, Dr. O. V. Brumley, Columbus; vice-president, Dr. C. H. Case, Akron; secretary, Dr. R. I. Bernath, Wauseon (re-elected); treasurer, Dr. D. C. Hyde, Columbus (re-elected).

Executive Committee, Doctors H. T. Moss, Dayton; W. B. Washburn, Tiffin; S. R. Craver, Youngstown.

Committee on Local Arrangements for the Entertainment of the A. V. M. A., Doctors Theo. A. Burnett, Columbus; F. A. Lambert, Columbus; C. H. Case, Akron; F. E. Anderson, Findlay; and W. A. Axby, Harrison.

R. I. BERNATH, *Secretary*.

OKLAHOMA STATE VETERINARY MEDICAL ASSOCIATION

THE winter meeting was held at Oklahoma City, January 19 and 20. Practically all the veterinarians in the State were present and more than usual interest was manifested.

The subject of "Tuberculosis Control Work in Oklahoma," as presented by Deputy State Veterinarian, W. P. Shuler, brought out a very lengthy discussion. The large doses of tuberculin recommended by some of the speakers brought an inquiry as to whether it might not be advisable to construct a "pipe line" to carry the larger doses which may be found necessary for subsequent tests.

An interesting feature of the program was "Round Table Talk," conducted by Dr. H. Jensen of Kansas City. This was designed to bring out the "trials and triumphs" of the practitioners, and many useful points were brought out.

The usual banquet was held at the Huckins' Hotel on the 19th, with more than one hundred ladies and gentlemen present.

Dr. A. T. Kinsley acted as toastmaster and the occasion was a most enjoyable one.

J. S. GROVE.

WORLD WAR VETERINARIANS OF AMERICA

ON December 3, 1919, at the Hotel La Salle, Chicago, Illinois, the realization of a plan was brought about, whereby all veterinarians who served in the late war could be banded together into a permanent organization. All ex-service veterinarians are eligible to membership irrespective of where they served during the war, whether it was at home or abroad, whether they held a commission or not.

The idea and plan has met with remarkable response, which is not only gratifying to the originators but likewise to everyone else whose attention has been brought to this organization. A good many

ex-service veterinarians have been enrolled as members and it is confidently felt that in the course of the next few weeks the greater majority of veterinarians will have joined as active members.

The purpose of the organization is in the interest of the welfare of the Veterinarian Corps of the United States Army and also to band together veterinarians who have many things in common. Thus there are two objects in view: a social as well as a benevolent object. The spirit of Americanism is uppermost in the minds of everyone and an opportunity will be given for every ex-service veterinarian to express his sincerity and one hundred per cent Americanism by enrolling as a member of this new-born organization. The enthusiasm and loyalty expressed at the Chicago meeting was sufficient proof to show that a very evident need was being met. Considerable discussion was carried on as to what good influences the organization could bring to bear and what benefits could be derived from the organization, and the only conclusion that could be arrived at was that the movement should be encouraged and every veterinarian who saw service during the late war be induced to join and lend all his aid to the full realization of the Society. The commendable work carried on in Washington in 1917 by some of our leading veterinarians resulted in the formation of the Veterinary Corps which worked so efficiently during the late war. The fruits of this labor must not be allowed to deteriorate and, if possible, improvements should be made.

An appeal is made to those veterinarians who have a certain degree of hesitancy to join the organization. Those who were unfortunate enough not to receive a commission and consequently served as enlisted men deserve nothing but praise, for it is very evident that during the conduct of such a war as was recently terminated some unintentional discrimination is perhaps bound to arise. We entreat all such men to show the broad vision and good judgment that we know they possess and to try to forget the unpleasant incidents that are now past history. Everyone in the Army encountered unpleasant things at various times, and due to the emergencies that arose some were placed in some extremely trying positions—those who received commissions as well as those who did not—but all had perforce to grin and bear it. War is never pleasant and everyone in the Army worked to bring it to its early close for that express reason. By becoming a member of the World War Veterinarians of America, every one is given an opportunity to suggest and work for improvements over situations he met while in the

army. Potentially this organization is strong and it is the earnest desire of all that every ex-service veterinarian join at once and thus give strength to it and allow it to give full vent to its powers.

The selection of officers resulted in the unanimous election of the following three: Col. L. A. Merillat, Orville, Ohio, National Commander; Capt. J. B. La Croix, Evanston, Illinois, Asst. Commander, and A. A. Leibold, Kansas City, Kansas, Adjutant; these positions corresponding, respectively, with president, vice-president and secretary-treasurer.

Five or six suggestions were made as to the most suitable name for the organization, and after weighing their virtues and discussing them at length, the name "World War Veterinarians of America" was decided upon, since this would stamp us as an independent organization and not subsidiary to any other, although every one felt that it was our duty to seek the co-operation of every other organization in the United States that could be of assistance to us in carrying out our objects. In order to defray the temporary expenses that were bound to be incurred in the way of postage, stationery, card index file, etc., it was decided to temporarily tax every member fifty cents to help meet these expenses. A number have increased their donation by giving a dollar.

The officers elected were instructed to begin work at once to draft a constitution and by-laws, which should be ready for consideration at the next meeting, which it is hoped will be in the near future. No unnecessary delay is expected, for every one so far has shown an unusual interest in this new organization. Letters have been coming in from all parts of the country with the expression that it is meeting a very necessary need.

Communications are requested to be addressed to Dr. A. A. Leibold, No. 510 Portsmouth Building, Kansas City, Kansas, or to the other officers.

A. A. LEIBOLD.

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS

February 14, 1920.

To the Members of N. A. B. A. I. Veterinarians, Greetings:

Through the courtesy of Dr. Mohler, the newly elected editor of this JOURNAL, our association is invited to use a limited amount of space monthly for the publication of such news and information as is of interest to our members. We believe this privilege should be readily accepted by our National Officers and subordinate associations, thereby getting in closer touch with our members and at much less expense than is possible through our National Secretary and district organizations. These notices must be submitted through the office of the President not later than the 12th of the month, and it is hoped that any member who has suggestions or items of interest will avail themselves of this method of dissemination.

I desire at this time to express my deep appreciation in having been selected as President of the National Association at the recent National Convention at New Orleans, La., and also thank all those present for the high honor bestowed upon me.

With a full realization that our organization, while still in its infancy, has accomplished gratifying results, I feel that we still have much work to perform before we arrive at the point when and where we can secure the recognition due the veterinarian in the Bureau of Animal Industry. I do not wish to infer that that recognition shall consist entirely in pecuniary advantages, but rather that by a certain pride in our profession, pride in our every-day work, and pride in thorough organization, we will have just cause to expect a full and merited consideration for our services.

The undivided support of each member is earnestly requested, and I especially appeal to inspectors in charge to deeply interest themselves in bringing about a full and enthusiastic membership in their locality.

Looking forward with a great deal of pleasure to the time and opportunity of greeting you personally, I remain,

Yours for a *hundred per cent* organization,

N. L. TOWNSEND, *President.*

COMMUNICATIONS

To the Members of the A. V. M. A.:

State after State the past three years have placed new dog-tax laws upon their statutes, largely at the urgent solicitation of the American Woolen Company and the various sheep growers' associations.

Every such bill plans to eliminate the homeless non-tax paying dog as the sovereign remedy for rebuilding the languishing sheep industry in our land.

While the Empire State has passed some fifteen or more amendments and new dog-tax laws in the last twenty years, all of which were directed toward the elimination of the dog problem, yet the number of sheep in 1870 was 5,000,000, and in 1916, 400,000 in this State.

Since the passage of the Wicks Dog Tax bill, one million of dollars has been collected. About three hundred thousands of dogs now contributing an annual tax fee.

More than a half million of dollars of this tax has been returned to the counties to be used for fire and police pension funds or other general purposes.

Not any of this money in this or many other States that have laid these new taxes has been set aside for the real purpose of re-establishing these flocks on a thousand hills.

The establishment of specially trained veterinarians to study the problems in every district of the parasitic enemies of sheep internal and external, the adaptability of the soil, climate, the rotation of crops on old sheep preserves, the transportation problems, the local markets for mutton, the community disposition of the wool, the breeds of sheep best suited for different localities, are all problems of paramount importance in sheep husbandry.

How much longer will the great body of dog owners who pay these taxes and whose dogs are not the sheep-killing type stand for this collection of monies under the pretence of rebuilding the sheep industry and this yearly misappropriation of these funds to other purposes?

Are our State and local veterinary legislative committees alive to the importance of seeing that these monies are spent for the purpose for which they are collected?

W. HORACE HOSKINS,
Chairman Committee on Legislation.

To the Editor:

I am enclosing herewith copies of letters from Sir Stewart Stockman and Professor De Jong of Leyden, Holland, with reference to the International Congress. It might possibly be of interest to the profession if you would publish these letters. Dr. De Jong appears to be in favor of holding the next International Congress in the United States.

A. EICHHORN.

DEAR DR. EICHHORN:

I am in receipt of your letter of 9th December with reference to the next International Veterinary Congress. I will bring the matter before the British Committee at as early a date as possible, but as these things cannot be done in a moment at these times, I am writing this to let you know that the matter will receive attention.

I may say that there have already been proposals from abroad that the next Congress should be held in London, but no proposal of any kind has as yet been seriously considered.

With best wishes,

Yours sincerely,

S. STOCKMAN, *London, England.*

DEAR SIR:

In reply to your honored letter of December 9, 1919, I have the honor to let you know that the Permanent Committee of the International Veterinary Congress is disorganized by the war, and I think that perhaps the representatives of the anti-German nations may not like to initiate anything at present with the Germans and their allies. Therefore the committee has to be reorganized.

Personally I think it a happy idea to have the future Congress at New York, but officially at this moment I cannot do much. But I have written to the Organizing Committee of the London Congress for advice and this week I will speak of the matter with Professor Barrier at Alfort, Paris. Immediately after my return and after having received the opinion of Sir Stewart Stockman at London I will give you a definite advice.

Very respectfully, I remain

Yours,

D. DE JONG, *Leyden, Holland.*

January 26, 1920.

HON. DR. D. A. DE JONG,
Professor, University of Leyden,
Leyden, Holland.

DEAR SIR:

I beg to acknowledge your letter of January 6 and wish to express my best thanks for the expression of your opinion that you are favoring the United States as the place in which the next International Veterinary Congress should be held.

I can assure you that the veterinary profession of America will be happy to entertain the International Veterinary Congress in the United States. We also hope to obtain the support of the United States Government as well as of all organizations connected directly or indirectly with the live-stock industry.

Furthermore, realizing the fact that many prominent veterinarians, whose presence at the International Congress would be a great asset, would not have means to make the trip to the United States, it has been tentatively agreed upon to raise a fund of at least \$100,000 from which honorariums would be paid to specially invited guests from different countries. These honorariums would be sufficient to defray the expenses of those invited. Furthermore, the selection of these guests could be left in each country to a special committee. These details, however, could be worked up at a later date and I only deemed it advisable to bring this to your attention at the present time in order that you may be in possession of this information when the place for the next International Veterinary Congress will be chosen.

Hoping that you will favor us with the continuance of your support and that you will be kind enough to exercise your influence to have the United States selected as the place for the next International Congress, I am, awaiting your further advice in this matter,

Very respectfully yours,

A. EICHHORN, *Secretary,*

Committee on the Eleventh International Veterinary Congress.

NECROLOGY

Dr. Joseph Plaskett, former City Veterinarian of Nashville, Tenn., died at his home in Peticton, British Columbia. After leaving Nashville many years ago Dr. Plaskett was connected first with the British army in South Africa throughout the Boer War, and later with the Canadian and British forces in France from the time England entered the World War till the armistice was signed. He was a graduate of the McGill Veterinary College and a nephew of Professor Duncan McEachran. At the time of the meeting of the A. V. M. A. at Nashville in 1897 he was a member of the firm of Rayne and Plaskett, but later formed a partnership with his brother-in-law, George R. White, as the junior member. On account of poor health he subsequently returned to his home in Canada. Plaskett was a fine fellow, quiet and most unassuming, but well educated and thoroughly skilled in his chosen profession.

Dr. Harvey Grant Werntz, aged 50 years, died in February at his home in Pittsburgh. Dr. Werntz had been in poor health for about a year. He was born in Fairview, Erie county, March 4, 1869, and obtained his early education in that city. He was a graduate of the Erie High School and received the degree of doctor of veterinary medicine from the University of Pennsylvania in 1912. In July, 1913, he came to Pittsburgh, and up until his death successfully operated his hospital. He was a member of the American Veterinary Medical Association, the Pennsylvania Veterinary Medical Association, the Veterinary Medical Association of the University of Pennsylvania and the Western Pennsylvania Veterinary Club.

He was a thirty-third degree Mason, a member of the Alpha Psi Fraternity and the Alumnæ Society of the University of Pennsylvania. He was also a member of Rochester Lodge No. 24, B. P. O. Elks, Rochester, N. Y.; East End Tent No. 20, Knights of the Macabees, Pittsburgh, and East Erie Circle No. 174, Protected Home Circle, Erie, Pa.

Dr. Werntz was a splendid type of magnificent manhood and a credit to our profession.

Dr. Robert H. Bird, a member of the American Veterinary Medical Association, died in Denver, Colorado, on October 26, 1919.

Dr. Bird was a graduate of the Royal Veterinary College, London,

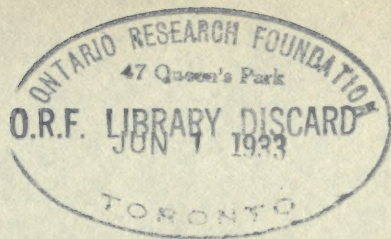
in the year 1873. He was admitted to membership in the American Veterinary Medical Association in the year 1895.

Dr. George B. Towne of Thompson, Connecticut, died at his home in Thompson on September 18, 1919. Dr. Towne was a graduate of the American Veterinary College in 1890. He joined the American Veterinary Medical Association in 1899.

Dr. Joseph W. Prucha, a graduate of the New York State Veterinary College, Cornell University, 1907, and an inspector in the Bureau of Animal Industry for the last five years, died at Denver, Colorado, on June 6, 1919, after an illness of two weeks. Dr. Prucha joined the A. V. M. A. in 1915.

In a 300-mile endurance contest with horses of the purest Arabian breeding, "Castor," a Morgan gelding bred by the U. S. Department of Agriculture at its Middlebury (Vt.) Morgan horse farm was the only horse with a clean speed record at the end of the grueling contest. "Castor" won third place for speed at the end of the contest, notwithstanding the fact that he fell in the deep sand on a bad bit of road, injured his nose, and made the last 5 miles in a walk. This achievement is an indication of what has been accomplished by the Department of Agriculture in the rehabilitation of the Morgan breed during the few years since the work was undertaken.—*Semi-Weekly Farm News* (January 6).

Dr. Ellis C. Stafford, Cornell '18, was married on July 19, 1919, to Miss Anne Hollenbeck, Cortland State Normal '18, after his return from service at Camp Greenleaf, Ga. Dr. Stafford has practiced at Blodgett Mills, N. Y., and holds a second lieutenancy in the Officers' Reserve Corps.



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